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*A Case Study of the Safety Match work and workers in South India*

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***Examining Non-formal Education in Complex Knowledge-  
production: A Case Study of the Safety Match work and  
workers in South India***

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*By: Narasimham N S V Peri*

*School of Education*

*A dissertation submitted to the University of Bristol in accordance with the  
requirements of the degree of Doctor of Philosophy in the Faculty of Social Sciences  
and Law*

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## ABSTRACT

This thesis problematizes and seeks to explain how knowledge is produced and transmitted in workplaces in the informal sector in India, and specifically the matchworks industry. There are three main questions at the heart of this thesis. First, how do mostly illiterate adult workers handle complex operations and secure the status as experts and transmitters of knowledge? Second, what insights might be garnered to contribute to learning theories in relation to workplace learning? Third, how might skills policies engage with non-formal work and learning in India so as to recognize diverse skill capitals? These questions open up an approach to learning in the informal sector I have called a cultural political economy of skills. The site for investigation is a detailed case study of the matchworks industry. The study focuses on matchworks enterprises and their occupational communities in several units across two clusters, ranging from manual operations to semi-mechanised and fully automated plants.

The design is a multi-method ethnographic study whose fieldwork extended over a fifteen-month period in South India. Philosophically, it is underpinned by a critical realist social ontology. Methodologically it draws upon Burawoy's (1998) *Extended Case Method* to examine the connections between the historical, political and local practices around the dominant narratives of workplace learning. Using their lived experiences, study of artifacts and observations in their workplaces, it engages with broader conversations of informal labour around credentialisation, apprenticeship and the politics of vocational policy.

The study reports six main findings. First, the idea of 'skill literacies' offers an alternate perspective as to how work is valued. Second, learning in the matchworks is often non-linear, thus challenging linear models of learning. Third, the matchworks occupational community has a trans-local reach; skills frameworks need to take a wider view of the geography of this community. Fourth, automation can be an enabler of new kinds of skills and is not necessarily a negative substitute. Fifth, women play a key role as workers in the matchworks industry, and bring wider social relations into the workplace, and vice versa. Sixth, the matchworks are deeply embedded in the wider social relations of the community, which also shape what is valued in the workplace.

The originality and significance of this research is that, it brings into view a relatively unstudied sector – the matchworks - using a multi-method ethnographic approach. It concludes that skill frameworks need to take account of these complex cultural political and economic skills relations as they contribute to what is valued, and to economic productivity. As such, when local, situated practices are taken into account these have in turn important implications for top-down skill frameworks that hope to recognize the informal sector via training and the recognition of skills.

*Keywords: Workplace learning; matchworks; informal economy; India*

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## **AUTHORS DECLARATION**

I declare that the work in this dissertation was carried out in accordance with the requirements of the University's Regulations and Code of Practice for Research Degree Programmes and that it has not been submitted for any other academic award. Except where indicated by specific reference in the text, the work is the candidate's own work. Work done in collaboration with, or with the assistance of, others, is indicated as such. Any views expressed in the dissertation are those of the author.

SIGNED: ...

A solid black rectangular box used to redact the author's signature.

DATE: 22 September 2018

# TABLE OF CONTENTS

List of Figures.....	ix
List of Tables.....	x
List of Appendices .....	xi
Glossary.....	xii

## SECTION ONE

### CHAPTER ONE

<b>Non-formal Work and Workplace Learning in India's Matchworks: A Place in the Sun? .....</b>	<b>1</b>
1.1 Introduction.....	1
1.2 Rationale for this Study .....	5
1.3 The Study Sector - the Match-Industry .....	9
1.4 A Cultural Political Economy of Skills (CPES) Approach .....	11
1.5 Rationale, Questions and Methodology .....	13
1.6 Significance of this Research .....	15
1.7 Outline of the Study .....	17

### CHAPTER TWO

<b>The Informal Work Sector of India as a Context for the Matchworks .....</b>	<b>19</b>
2.1 Introduction.....	19
2.2 The Formal/Informal Labour Landscape .....	19
2.3 Wider Conceptions of Informal Work .....	23
2.4 Work in Post-Independence India.....	27
2.5 Organizing Workers' Training in India.....	31
2.5.1 Apprenticeships .....	32
2.5.2 Credentialising .....	34
2.5.3 Employability.....	38
2.5.4 Vocational Learning .....	40
2.6 The Matchworks Industry as a Case Study.....	42
2.7 Conclusions.....	48

### CHAPTER THREE

<b>Learning Theories and Workplace Learning .....</b>	<b>49</b>
3.1 Introduction.....	49

3.2	Locating Learning Theories for the Workplace .....	50
3.2.1	Cognitive approaches to learning .....	50
3.2.2	‘Situated’ learning theories.....	55
3.3	Beyond Codified Knowledge: Learning from Others/transferring Expertise	57
3.3.1	Transferring knowledge and skill to the machine .....	59
3.4	Workplace Learning .....	62
3.5	A Skill Model for the Workplace?.....	67
3.6	Extended Discontinuities in the Formal/Non-Formal Workspaces.....	69
3.7	Conclusions.....	70

## **CHAPTER FOUR**

<b>Approach, Methodology and Methods .....</b>	<b>73</b>
4.1 Introduction.....	73
4.2 Initiating the Field Research.....	75
4.3 Which Theoretical and Methodological Approach to Examining ‘Routine’ Workplace Learning? .....	78
4.3.1 General remarks on paradigms .....	78
4.3.2 A Critical Theory/Critical Realist Approach.....	78
4.3.3 The Ecosystem: Occupational Community of the Matchworks .....	83
4.4 ECM as a Methodology .....	84
4.5 Engaging with the Field: the “How”? .....	88
4.6 From Data Collection to Analysis .....	89
4.6.1 The sample .....	90
4.6.2 Visual methods.....	94
4.6.3 Semi-structured interviews.....	98
4.7 Critical Discourse Analysis (CDA).....	99
4.8 Reflecting on Methodological Issues .....	101
4.9 Conclusion .....	103

## **SECTION TWO**

### **CHAPTER FIVE**

<b>In the Workplace I: Valorising Informally Acquired Skills .....</b>		<b>106</b>
5.1	Introduction.....	106
5.2	Valorising Skill.....	107
5.3	The Social Context of the Workplace Knowledge .....	118

5.4	Reconstructing a Tiered Ontology of the Workplace.....	121
5.5	Valorising Informal Skills .....	122
5.5.1	Valorisation by Recognition .....	123
5.5.2	Valorisation through enhanced meaning of work.....	125
5.6	Flat but still Hierarchical in Nurturing Institutional Expertise .....	125
5.7	Conclusions.....	128

## CHAPTER SIX

<b>In the Workplace II: Learning and Work in a Complex Ecosystem.....</b>	<b>130</b>
6.1 Introduction.....	130
6.2 Value and Worth in the Context of Machines .....	143
6.3 Introducing the 5-Stage Skill Model.....	144
6.4 Departures from the Dreyfus Model.....	147
6.4.1 Thematic disagreements with the formal models.....	148
6.4.2 Non-linear learning at the workplace .....	150
6.4.3 Multiple literacies - challenging the monologics of formal learning? .	151
6.5 Codifying the Tacit Knowledge: Issues of Replicability and Scale.....	152
6.6 Conclusions.....	154

## CHAPTER SEVEN

<b>In the Workplace III: From the Particularity of the Matchworks Ecosystem to the Generality of the Skill Regime .....</b>	<b>156</b>
7.1 Introduction.....	156
7.2 (Non) Local networks and skill flows.....	157
7.3 Skill Flows <i>Within</i> the Local Ecosystem.....	159
7.4 Repurposing the ‘Employment for Learning’ Contract .....	164
7.4.1 Formal consultative mechanisms versus organic evolving structures ..	166
7.4.2 Credentialised Access for Women Workers? .....	168
7.4.3 Knowledge Transfer through Worker’s Transversability .....	169
7.5 And what of research on local practices for informing skill regimes? .....	170
7.6 Conclusion .....	175

## SECTION THREE

### CHAPTER EIGHT

<b>Thematic Conclusions .....</b>	<b>180</b>
8.1 Introduction.....	180

8.2	Valuing Work: Valorising Skill beyond Labour? .....	184
8.3	Emergence of the <i>Non-local</i> Spatial versus Boundedness of the Workspaces 189	
8.4	Automation is not “zero-sum”: when it builds (skill) and destroys (skills) .	192
8.5	Women’s Learning: An Outcome of Expansive Frameworks? .....	196
8.6	How Much to Credentialise, and How? .....	201
8.7	Forms and Implications of <i>Routinisation</i> .....	204
8.8	Conclusions.....	207
<b>CHAPTER NINE</b>		
<b>Final Conclusions .....</b>		<b>208</b>
9.1	Looking Back.....	208
9.2	Looking in and on – Key Findings .....	210
9.3	Policy Recommendations .....	215
9.4	Methodological Reflections .....	216
9.5	Originality and Significance and Ongoing Research.....	218
9.6	Final Reflections .....	219
A. Bibliography		
B. Appendix		

## LIST OF FIGURES

Figure		Page
1.1	The Workplace at the intersection of top-down and bottom-up conditions	8
1.2	The interrelationships of vocational practice	14
2.1	Framework for the Formal-Informal Economy applicable to the Matchworks Industry (adapted from Hussmann, 2004)	22
2.2	An Extract of a Report showing demographics of vocationally (formally) trained persons	36
2.3	Vocational Education System in India (adapted from World Bank, 2007: 35)	43
4.1	Novelli's (2004) representation of the Extended Case Method	88
4.2	The Research Process Schematic	90
5.1	Transfer of learning through spaces	113
6.1	Skill Regimes and Ecosystem	136
6.2 (a)	Mechanised Process	138
6.2 (b)	Kanakam's frame	141
7.1 (a)	Workers in closed group	161
7.1 (b)	Individual worker with filling frames (manual)	161
7.2	An automated Box-filling process	162
7.3	High end Printing Process, that replaced manual process of painting the striking surface of the matchboxes	163
7.4	Highlighting the potential intersections of policy. The extent of the shading reflects the dependency of the stakeholder groups towards practice impact of Knowledge Production	173
8.1 (a)	Visualising the Workplace Learning- some examples	182
8.1 (b)	The cyclical process of social relations in the workplace	187
8.2	Occupational Community of Women in the Matchworks	197

## LIST OF TABLES

Table Number		Page
2.1	Forms of categorization of frameworks and how they are differentiated	42
3.1	Framework highlighting gaps emerging from the Formal-Non Formal continuum	70
4.1	The Research Process – Steps and Timelines	92
8.1	Summary of Research Findings	183
8.2	A comparison of Expansive and Restrictive Learning	200

## LIST OF APPENDICES

Appendix Number		Page
Appendix I (a)	GSOE Ethics Form Summarizing Ethics Meeting	I
Appendix I (b)	Ethical Considerations (During and After Fieldwork)	VII
Appendix- II	List of Locations and Workplaces where studies or interviews were conducted	XV
Appendix III	Map Showing the Match Industry	XVI
Appendix IV	List of Participants	XVII
Appendix V (a)	Match Industry Data- Question in Parliament showing number and distribution of Match Units	XXIV
Appendix V (b)	Match Industry Circular – Showing Number of workers in Organised (Formal) and Unorganised (Informal) sector	XXVII
Appendix VI	Match Industry Tax Structures: The nature of work is dependent on this categorization	XXVIII
Appendix VII	Exemplar: Skill Gap Analysis using Policy	XXX
Appendix VIII	Artifact: Extract from a trade souvenir- The Match Makers of Sivakasi (Legend: The self-employed town)	XXXII
Appendix IX	NSDC Context Note	XXXIII
Appendix X	The Match Making Process	XXXIV
Appendix XI	Questionnaire: Semi-structured Interviews	XLI
Appendix XII	Questionnaire- Policy Maker	LIV
Appendix XIII	Proposal for Qualitative Research- NSDC	LX
Appendix XIV	Signed Consent- Interviews	LXVIII
Appendix XV	Signed Consent - Photographs	LXIX



## GLOSSARY

CCPEE	Critical Cultural Political Economy of Education
CDA	Critical Discourse Analysis
CR	Critical Realism
CEDEFOP	European Centre for the Development of Vocational Training
CPE	Cultural Political Economy
CPES	Cultural Political Economy of Skills
DGET	Directorate General of Employment and Training (Government of India)
ECM	Extended Case Method
FD	Foundation Degree programmes
ILO	International Labour Organisation
ICT	Information and Communication Technologies
ICLS	International Conference of Labour Statisticians
MLE	Ministry of Labour and Employment
MSDE	Ministry of Skills Development and Entrepreneurship
NOQ	National Occupational Qualifications
NOS	National Occupational Standards
NSDA	National Skill Development Agency
NSDC	National Skill Development Corporation
NVQF	National Skill Qualification Frameworks
NCAER	National Council of Applied Economic Research- India
NCEUS	National Council of Enterprises in the Unorganised Sector
NSS	National Sample Survey- India
OECD	The Organisation for Economic Co-operation and Development
QP	Qualification Packs
RPL	Recognition of Prior Learning
RVTI	Regional Vocational Training Institutes for Women
SSC	Sector Skill Councils
TVET	Technical Vocational Education and Training
VE	Vocational Education
VET	Vocational Education and Training
VT	Vocational Training
WBL	Work-based Learning
WPL	Work Place Learning
WITI	Women's Industrial Training Institute



## **CHAPTER ONE**

# **Non-formal Work and Workplace Learning in India's Matchworks: A Place in the Sun?**

### **1.1 Introduction**

In a statement to the Indian Parliament on 12<sup>th</sup> August 2015, the Minister for Skill Development, Rajiv Rudy, pointed to the radical differences between India and those countries it would like to emulate, reiterating his earlier observations that:

...4.69% of the total workforce in India has undergone formal skill training as compared with 68% in the UK, 75% in Germany, 52% in the US, 80% in Japan and 96% in South Korea...(PTI, 2015: 1).

He was speaking at the highest law-making body in the country, in the context of policies and programmes required to generate skill acquisition and employment opportunities through his newly formed ministry. He laid out the challenge for India: India must review and revamp the formal systems available to train people to acquire skills, accessing new opportunities through education and training.

Despite the daunting challenges and the under-development of formal mechanisms of vocational education and training in India, the Minister nonetheless emphasised the need for the Indian government to build a training and skills ecosystem to 'ready' a staggering number of four hundred and two million workers for employment by 2022. In a subsequent address to Parliament (Rudy, 2016), he acknowledged the presence of traditional systems that also needed to be nurtured so as to also contribute to such an ambition.

Despite the enthusiastic reception of the Minister's speech, including the daily press (Business Standard, 2015) there were two key aspects of employment and training in India's economy that were absent in the Minister's speech. The first aspect was the sheer size of the informal economy (ILO, 2002, pp.53-54), that is; some ninety-two % of the working population in India. The second was that there was no mention of, or reference to, how many of India's workers were currently credentialised.

Both the size of the informal economy as well as the implicit credentialisation of a constantly 'changing' number were symptomatic to the conundrum of skill development. The headline numbers of over 400 million workers, staggering by any standards - were derived from quantitative surveys dating back to 2009 (NCEUS, 2009). Implicit in the announced numbers was 'credentialised workers' or those that were recognised through a formal certification or qualification. Yet, despite the high visibility of the statement, such figures were only partially relevant for discussions in 2015, as the earlier skill policy referred to the number to be skilled at 500 million<sup>1</sup>. What was not explained, were the methods proposed to train such huge numbers of workers – whether they be new entrants or existing- including those in the informal economy.

This task was to be undertaken by the nascent Ministry of Skills Development and Entrepreneurship (MSDE) that had been set up a few months before the Minister was addressing the parliament.<sup>2</sup> As if to compound the challenges, there was no documented history of how many of these uncredentialised workers had been formally trained in the past. If these informally trained workers were to be now credentialised, what frameworks might be used for this massive undertaking in the absence of a history of experience to draw upon? Put another way, if large swathes of the working population were uncredentialised, in the informal economy, or outside the visibility of official government machinery, the government's

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<sup>1</sup> National Skill Development Policy (2009: Preamble, p.1)  
<http://www.skilldevelopment.gov.in/assets/images/NationalSkillDevelopmentPolicyMar09.pdf>

<sup>2</sup> Prior to the setting up the Ministry of Skill Development and Entrepreneurship (MSME), usually referred to as the Skill Ministry or the Ministry of Skills, this subject was in parts spread across almost 17 other Ministries including the more logical Ministry of Labour and Employment (MLE)

commitment to developing its training and employment ecosystem would be far from complete without considering those ‘invisible practices’ outside the ‘usual’ sectors of employment that absorb large numbers of workers. The policy document, preceding the Minister’s announcement was itself on the political agenda of employment generation for the government since 2009; and continued in a new regime in 2014.

The ‘invisible practice’ elements that I refer to include, *inter alia*, smaller craft units, vocational enterprises employing traditionally trained workers, the overlapping informal workforce on the fringes of the formal system, small and medium manufactories. Their labour pool came from traditional supply chains and their training was far from any formal system of training or credentialisation. Would all of them be included in a large policy drive to enrol millions of workers? If they remain excluded, the Indian government’s un-nuanced and untried proposals might simply devalue through making invisible generations of accumulated learning in sectors that might not conform to this imagined new economy of skills. *This thesis attempts to grapple with this conundrum; an ambitious government hoping to emulate countries like Germany through the development of a new skill regime that trains and credentialises workers, and what this might mean for an informal economy whose own skill regime and allied social system was not recognised with its very different kind of teaching, learning and valuing.* Industrial systems and labour models that straddle the informal economy, informal sector of employment and their knowledge practices have to be brought centrestage to this discussion.

It is in this context that the matchworks, a sector prevalent from the industrial revolution, and still relevant in its product use, and not represented in the ‘new-technology’<sup>3</sup> industries is proposed for this study: in exploring the policy and practice conundrum, the geographically-isolated industry with limited purchase on

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<sup>3</sup> Largely connected with the microelectronics-led Information and Communication Technologies (ICT): A Dictionary of Sociology 1998, originally published by Oxford University Press 1998.

national labour and economic policy could offer useful insights from similarly unrepresented sectors.

To answer the question of how credentialisation is important and to whom, we would need to find answers to a set of supplementary questions: What does credentialisation mean for the worker, her learning and her livelihood choices? Will it enhance benefits from an economic sense of getting a better job or more wages? Will the worker's learning more, with a recognition outside of her place of work incentivise her to be paid more at her workplace? In contexts that have depended on social relations for getting employment, obtaining training and at times becoming an entrepreneur in the matchworks supply-chain, how does formalising learning help the workers? From a policy perspective, the stated aim of getting over 400 million workers trained is interpreted as getting that number through a formal system of skill enablement, with some sort of recognition through an accredited system (NSDC, 2009). In other words, capacity building is tuned towards larger numbers of 'trained' persons through a formal mechanism. It stays silent on what if any will be the recognition for workers in workplaces similar to the matchworks, who may have a different way of acquiring training and are not relevant to the larger skill reservoirs that feed into the 400 million. It should also be remembered that this pool is largely synonymous with the informal sector of the economy, whose influence is key to understanding vocational policy.

A related set of questions arise from a policy perspective as well: a) what possibilities might emerge for an informed approach for policy development, b) is there a relationship between the nature, scope and shape of workplace learning in the informal economy, and the development of a system of recognition (credentials) that takes this learning into account? Could it be that what is valued in workers in the informal sector such as the matchworks, would have no equivalent valuing via recognition in the government's skill regime? What might policymakers learn from industries, such as the matchworks, about the complex nature of learning, when in many cases the workers have no formal literacy? How might a worker and their learning be valued, and not mis-recognised, in the development of the government's

skill regime? These kinds of questions are at the heart of this work and will be elaborated further in this introductory chapter so as to direct the thesis work. In short, this Chapter problematises credentialisation as a process that is applicable to the matchworks, and indeed the larger vocational spaces.

## **1.2 Rationale for this Study**

In order to engage with the potential consequences of the Minister's address to Parliament for workplace learning in the informal sector and what it might mean to credential learning, it is important to stand back so as to place this event within a wider socio-political, economic and cultural context. This means tracing the history and its assumptions behind such announcements so as to problematise: first, the socio-political narratives that affect workplaces and their approaches to learning; second, the nature of the (uneasy) coexistence of policy regimes and their numbers to the daily reality in workplaces organised through a history of informal learning; third, to examine the nature of the learning that might characterise informal workplaces, and fourth, to ask what is at stake for industries like the matchworks when systems of recognition are restricted to credentialised, formal systems of pedagogy, in other words *a bureaucratisation of this field*? I come back to this conceptualisation while proposing a cultural political economy (CPE) lens for skill development.

One argument that is made in this chapter and developed in later chapters is the continuing delineation of usage regarding 'skill'. The 'political' definition of skill is not the same as the 'performative' nature of skills (Section 1.4) and later connects to Chapter Five. The learning theories (Chapter Three) look at the performative aspects, as well as from the point of view of academic and policy definitions.

Four key substantive issues will be important to this study. Firstly, in drawing attention to such issues, it is important that I go beyond an unhelpful pitting of a cultural anthropological approach (lived realities/meanings) against an economic

and political framing. I will argue a more generous cultural understanding of the workplace to be invoked so as to first examine, and then interpret, how knowledge that has been generated for decades through indigenous ways of learning, often occupying a place that is between the formal and informal employment practices. This insight draws from the work of Robertson and Dale (2015) and their insistence on the importance of bringing together the cultural, the political and the economy as heuristics that help focus attention on social meanings, the nature of social power and forms of social exchange. In this study I draw on this work to refer to a cultural political economy of skills (CPES) which may include 'non-recognized skills – the key assumptions and dynamics of this approach are developed below.

Secondly, how might recognition of the specificities of culture/place contribute to a more relevant and contemporary 'vocationalism' in India, and how these might mediate vocational pedagogies as well as the constitution of vocational knowledges (Avis, 2014, p. 46)? If, as the policy proposals claim, vocational education and training can further economic goals (Government of India, Skill Policy, 2015), how can the specificities of the 'cultural' of the political economy of workplaces in India find their way into discourses that are set within particular historical, socio-economic or national contexts?

Thirdly, if the skill regimes push for conformity to formal systems, how and how much would this affect the existing systems of knowledge production? Are we confusing *work-based learning*, more apparent in vocational education systems and amenable to credentialisation with more a broader, and less-defined system that emerges from *workplace learning*? Avis (2014) introduces the idea of credentialising as the differentiator between work-based and workplace learning: the latter, when credentialised, results in the former. Winch (2013) argues that there emerges a strong occupational identity at the workplace, sans credentialisation, that can still contribute to the building of standards of work that can be associated with its output that establishes a reputation for the goods and services beyond the workplace (see p. 1208). The lack of substantial research or literature relating to the workplace, work practices, as well as work related education and learning (Illeris, 2003), has



now more recently been compensated with *some* research focused in India over the last two decades, particularly in the informal sector space (Jhabvala, Sudarshan and Unni, 2003, p.21). Intersecting such an emerging discipline of workplace studies with the informal sector has, nevertheless been restricted to areas like crafts-making, traditional weaving, pottery and village-based occupations. However, the workplace studies in smaller work locations and petty-areas of production (Hariss-White, 2010) in non-urban areas represent an under-studied area (as a package but drawing on other literatures of learning, that we discuss in Chapter Three). Even rarer is any study of sociological importance within an uncommon industry like the matchworks - the industry at the centre of this investigation. There is no published qualitative research on the match industry, despite its historical significance in India (and beyond), and its current role as a contemporary industry sector and local employment generator, all within a changing demographic of supply, technology and market changes. In addition, no empirical research has been conducted on any practice related to vocational education, training or practice in this sector.

Finally, how does India's skill strategy fit within the broader contextualization of Vocational Education and Training (TVET) that is not only Western-focused but also, an implicitly top-down construct? TVET is closely linked to skill development, and both have evolved to have their own institutions, vocabulary and political apparatus. I use the prefix of *technical* for this study to denote an aspect of VET differentiated from other vocational education and training systems, like doctors and engineers; UNESCO's designated body for vocational education UNEVOC uses TVET, VET, Career and Technical Education as identical in meanings<sup>4</sup>. TVET in its predominant form, largely Western-focused, and concerned with industrialised practices and apprenticeship apparatuses within them (Euler, 2013) may or may not work for all labour models. I argue that TVET itself has differing notions, definitions and scope, largely subservient to the politics of skill development in respective nation-states. For this study, TVET is used to denote the practices rather than the institutions surrounding it.

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<sup>4</sup> [http://www.unevoc.unesco.org/tvetipedia.0.html?&tx\\_drwiki\\_pi1%5Bkeyword%5D=TVET](http://www.unevoc.unesco.org/tvetipedia.0.html?&tx_drwiki_pi1%5Bkeyword%5D=TVET)

Whilst this study works around the concept of apprenticeship, it is with a limited overlap to its formal connotations and definitions (Fuller and Unwin, 2011). Regardless, there is an attempt to draw broader generalisations into the world of workplace learning and its implications for vocational policy, and its problematic existence with the systems of formal credentialisation, some of which may also use formal apprenticeship models. As an example, the Dreyfus model of skill acquisition (Dreyfus and Dreyfus, 1986) assists in understanding how an apprentice could progress through the skill phases but does not explain all the processes that she undergoes to reach the phases. The research reported in this thesis focused on the surroundings and contexts of the learning, as differentiated from the decontextualized systems of learners in formal classrooms.

Top-down conditions		Bottom-up conditions
Global level (ILO/CEDEFOP)	<b>Practice Level</b>  The Workplace as a unit of study	Informal Economy
National Level (Policies/National History/ Industrialisation/ Labour Reforms)  Formal Mechanisms of credentialisation		Cultural/Historical workplace context

Figure 1.1: The Workplace at the intersection of top-down and bottom-up conditions

I intend to problematize TVET in India to recognize, firstly, the practices in their own ecosystems, and secondly, to be able to identify a system of credentialising that connects the need for recognition beyond the local to bottom up approaches that find a potential meeting place for the two. This study aims to contribute to the conceptualization of 'shadows of practice' relating to the industry and beyond, through an explicitly 'bottom-up' empirical approach. I call it the shadows for the same reason that the practices are *invisible and immeasurable* to the formal mechanisms. An attempt is made to trace the formal institutions of learning and

their relationship with the informal and non-formal. The shadows emerge because the non-formal practices and practice areas are either not 'counted' in policy discourses or have an unequal lens for 'measuring up to the formal mechanisms. It is this gap, which the study illuminates to be able to reduce it, eventually, in some measure. The top-down processes are referred to at the relevant places in the thesis to denote the impact of, or dependencies between, with external and institutional frameworks. This framework is shown in Figure 1.1.

### **1.3 The Study Sector - the Match-Industry**

The match industry, chosen as the sector for this study, has today exports of over US \$43 million (Department of Commerce, 2015), and employs by its own estimates some 300,000 workers<sup>5</sup>. The number is not much higher when compared with reports of a quarter million in the last two decades (Tandon, 1991). A bulk of the matchworks production is in the two districts of Virudhunagar and Vellore, both in southern state of Tamil Nadu, India. This trend has continued for several decades now<sup>6</sup>.

The industry and its labour requirement, including its automation efforts, does not appear in any common discourse of either an industry bell-weather or to highlight any aspect of vocational training in the chest-thumping of numbers employed or trained by agencies like NSDC. However, its practices, sustained over decades, have survived and been transformed as a result of technological and economic changes, but been dependent on knowledge systems that could transcend their domain boundaries to contribute to the emerging knowledge base of informal learning and vocational training.

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<sup>5</sup> See Appendix-VII: A statement from the South India Match Manufacturers Association, Kovilpatti dated 3.7.2001 showed the total strength (organized and unorganized) sector at 700,000. This number is in the current scenario strongly contested by the players themselves.

<sup>6</sup> See Appendix- V: A Question (# 6450) in the Parliament of India, on 4<sup>th</sup> April, 1984 (pp. 2-4), addressed to the then Minister of Industry, seeking the number of Match Units was given as 9827, out of which 8963 were in Tamil Nadu, the state in which this study was conducted.

In such circumstances, knowledge production processes, as learning models at the workplace, are unique and not entirely comprehensible using dominant models of research and pedagogy to make sense of them. There is a need to understand how this knowledge production, circulation and use happens, and unravel their temporal, cultural, political and socio-cognitive, determinants (Ringberg and Reihlen, 2008). These are manifest in how tacit knowledge is built up and shared (Armstrong and Mahmud, 2008), how knowledge is passed from one generation to the next (Starks, 2013), how the social dynamics of the workplace intermingle with, and take cultural cues, from the wider social system that is unique to those villages, and how new ideas and labour both become part of and transform knowledge production in that sector.

The perceptions of the industry and its realities seemed different in December 2007, when I first went for a site-visit to a mechanized match unit. This was well prior to this study, but already I was hooked into wanting to know more. The industry was clearly undergoing huge technological changes, but there was also a visible need to rely on labour-intensive processes, with workforces ranging from two to over several hundred workers in a single unit. What stood out was the low level of formal education that the workers appeared to have, even as they carried out complex operations. For several decades, generations of match workers were seemingly engaged in making a livelihood without any formal education, yet at the same time managing processes that had work-flows and presumably some exposure to knowledge transmission via formal processes: chemical mixing, handling inflammable substances, machinery and changes to their work environment without any formal intervention of re-skilling or change management.

How did these workers learn their job, perform their tasks, and train others to perform? What were the factors that influenced employment if the workers had no formal qualifications? As my study became a reality, answers to these questions beckoned, but they were not answers that spoke easily to the textbook accounts of learning in the workplace. I elaborate on this further in the methodological choices made for this study in Chapter Four, attempting to address questions on why this

choice represents an explanation of the problematic of knowledge production.

#### **1.4 A Cultural Political Economy of Skills (CPES) Approach**

As noted above, the activities typically characterized as ‘Vocational education and training’ have been viewed through the lens of political economy and organizational learning (Streeck, 1989; Busemayer, et al., 2012). Moreover, the economic dependencies of skills leading to employment echo John Kenneth Galbraith’s modeling of the economy as a machine that feeds off raw material and labour. Skills become an important fuel in the politics of economic development: from the employers who crave for labour, and the youth who crave employment and the economy, the idea of skills define unequal equations through human capital theories that bundle narrowly defined technical skills into some sort of raw material that must be invested in and valorized in particular ways (Brown, Green and Lauder, 2001, p.13). ‘Skill’ is a positively loaded message for governments, where employability in many cases is surrogated with a messaging of skilling, alluding to livelihood enhancement or guarantees, continuing employability or even self-employment.

Any usage of skill in this context could be referred to as the political definition of skill. This is different from the skill models that we see in Chapter Three as well as the expertise acquired in the workplaces covered by this study (Chapter Five). Yet as I noted earlier, there is a ‘cultural’ dimension that is distinct from the political and economic. To talk of the cultural is to talk of how we make meaning. In including the cultural as a distinct dimension from, though connected to the political (power) and economic (exchange) in this study is to argue that such a heuristic draws attention to the phenomenological, or socially-constructed, nature of the worlds that we see. Studying learning in the matchworks demands such an approach. For this reason, a cultural political economy lens adds to the overall strength and robustness to the study in that it also extends existing lines of argument by also directing attention to the relationship between social relations and subjectivities. More specifically, there

are two consequences to the questions raised (in Section 1.2) of the bureaucratization of the (vocational) field including TVET whose focus is on the politics, economics or technical aspects: first, it limits the scope and depth of the study; and second, it clearly requires a 'cultural' dimension to identify and include- 'tacit knowledges', as well as the culturally-mediated social dynamics of the workplace, into official vocational landscapes.

Robertson and Dale (2015) outline of what they call 'Critical Cultural Political Economy of Education' (CCPEE). Their theoretical approach is to 'understand social formations', like the above, placing under scrutiny the political economy of social relations and the socio-cultural nature of subjectivities (p.149). Using the concept of 'an ensemble education', they attempt to explain processes, like globalisation, and its consequences by engaging the multiple relationships of education with its structuring societal contexts, its complex agency and forms of social reproduction. I *extend* this explanation to the specific context of vocational education and training - precariously perched on the policy agenda, on one side, and the individual, on the other. I suggest that the abstraction of skill, competence and expertise is a function of social relations as much as the domain knowledge that the individual creates or reproduces. This expands into a collective body of experiences that links the specific and particular to the larger processes and practices.

The multiple entwinements around cultural artifacts, spaces, forms of engagement and their social meanings, economic dynamics, and political priorities and decisions that shape understandings and recognition of skills in any one context – and therefore the processes of vocational practice - triggers a line of questioning that is more open to, and generous about, the lived realities of learning in the informal workplace. These top-down dynamics include framing ideas, policy and programmes at the global level by agencies such as the ILO and CEDEFOP, as well as the trends, histories, and policies, of nation states. Bottom-up conditions envision the cultural and historical contexts of workplace and work practices and their (non-bureaucratic) organisation. The practice level, as represented in Figure 1.1 and the unit level of the study, is enmeshed unequally between the top-down and bottom-up conditions.

This conceptualization forms the basis for the study.

## **1.5 Rationale, Questions and Methodology**

How might we look at multiple forms of learning - rather than simply 'education' - along with their pedagogical practices, so as to better understand the changing learning needs of workplace, community and society so as to address them in the fullest of senses? As Bathmaker (2013) observes; "...questions of knowledge are questions of equity and justice" (p.102) with the power to enable livelihood and learning opportunities for young aspirants entering the workforce.

Linking the traditional to new systems poses a challenge in countries like India, as the new generation from traditional occupational communities is forced to align themselves to a more formal 'qualification' system, even as the policy machinery is isolated from the practices of the communities. Unluhisarcikli (2007, pp. 115-118) traces the history of the Turkish guilds and the apprentice norms that nurtured the skills of the craftsmen and women, particularly those regarded as traditional and also hereditary occupations, so as to make the transition to the new apprentice norms.

I visualize the vocational landscape in India as represented in Figure 1.2. The blocks are not static, and their overlaps represent important dependencies so to reflect the fuzziness of how each aspect is seen with respect to other policy regimes. For constructing this study, I visualize *formal* knowledge production as the "stone in the middle of the pond" from which the ripples of vocational policy, nuances of the informal economy in India, workplace studies, and constructs of learning models, flow out and in.

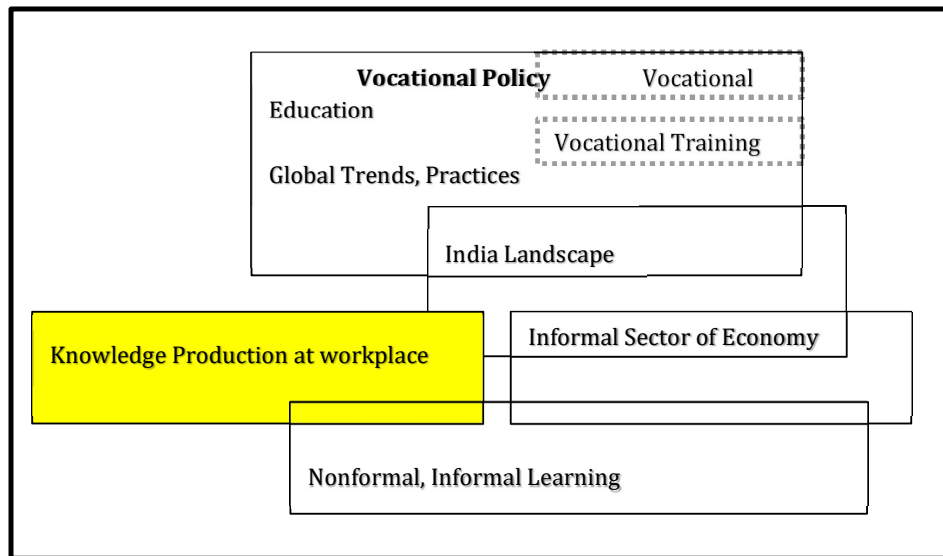


Figure 1.2: The interrelationships of vocational practice

The question: *How is knowledge produced?* is an epistemic starting point for this study. However, if one asked the question from an ontological perspective, it accesses a very different set of paradigms – such as, what are the properties in societies and people that might make them objects of knowledge’ (Bhaskar, 1978, p.13)? By asking the ontological question, the very visualization of the society with its stratifications and differentiations is brought to the fore. Since I am interested in contextually-mediated forms of learning (at this stage, I align it with *education*), which in the case of India are mostly informal, the research hovers over the vocational space. My purpose is to unravel the layers of influence, with the individual learner - the apprentice - at the centre.

The overarching, and possibly the wider, ‘political’ question is whether, how, in what ways, and with what outcomes, the current formal policy and policy structures in India take into account the practice determinants of knowledge production in sectors like the matchworks? Locating the study within the informal sector of the economy, three questions are raised as follows:



**Research Question 1:** In the absence of formal education, how do newcomers in the match making industry encounter complex knowledges? In general, how do workers like themselves develop new skills and adapt to new circumstances?

**Research Question 2:** How and how much can such non-formal models of learning and skill be recognized and valued by the formal credentialised systems, and contribute to learning theories in general?

**Research Question 3:** How can the nature and shape of workplace learning in the informal economy inform policy initiatives for countries like India?

To explore these questions, an ethnographic study of matchmaking units in two clusters in south India will be operationalized. The ethnographic methods used are a combination of visual methods, images, and artifacts, and a thick description of the workplaces and the context of the workers.

Six broad themes emerged after a 15-month process of interviews with 42 respondents in 4 categories (39 primary and secondary respondents with 3 interlocutors), some of them conducted over several sittings in workplaces, homes and common places. The interview method itself was a semi-structured. It was modified each time to capture each worker's way of working, the learning path of the apprentices and novices, and learning moments that were visible amidst perceptibly routine work transactions. The last were used to trace the origination and transfer of knowledge production in the workplace. Crotty (1998) refers to this as an implicit or unthematized set of processes.

## **1.6 Significance of this Research**

This study locates itself at the intersection of the two sets of knowledge producing forces: the vocational policy and labour landscape (specifically the uniquely huge informal economy), on one hand, and the socio-cultural and historical knowledge processes which shape the trajectories of the matchworks in these Indian villages, on the other. Whilst keeping the central focus of the study on the micro-practices –

that is the unit of work and its specific forms of learning - the study telescopes outward so as to draw connections to the meso- (workplace/village) and macro- (national policy/cultural histories) levels. In other words, we need to extend the premise that not only is knowledge production characterized by its social context (Hordern, 2016, p.454), it is also subjected to political and technological dynamics that shape these levels. I am particularly interested in those problematic spaces where national level policy and trends intersect with local practices.

In the course of the literature review (see Chapter Three), I have attempted to map my path of inquiry, not as a process of elimination, but by using relevant theories to address the research questions. In other words, I visualize a ladder whose steps rest on several theories of learning - from the cognitive to situated, experiential, gender-based and work-based, in turn, using these to illuminate learning in a sector that has largely existed in the shadows. The relevance of the study and its research objectives will bring in important perspectives at a time when the politics around vocational education and training are high on the agenda in several nation states, including India. With the skill development policy (Skill Policy, 2015) announced and serving as a reference framework, the study offers a qualitatively informed set of data points that could be of significance in further study of workforce learning.

Conventional learning theories, elaborated upon further in Chapter Three, not only fall short of explaining workplace behaviour in the sector I am looking at, but tend to rely on a differentiated concept of learning (Illeris, 2003, p.176) in their attempt to explain conditions of learning at the workplace. I will come back to these ideas throughout the thesis: the stereotypical gendered perceptions of skilled workers, the manual versus automation effect, and the formal versus informal sectors. These are all problematized and analyzed throughout the study, and which shapes the direction taken, and conclusions, of the thesis.

Pilz (2016) notes that despite the importance of the role of the informal sector in India, there is relatively little - notably empirical - research on the subject of vocational education. The gaps in research on the informal sector, and their related

methods of research, have been emphasized by Breman(2013, pp. 27-28). This work has covered the informal sector in India over the last few decades. My study hopes to fill in a small portion of this gap by bringing some of the findings into a wide conversation on informal work and learning in India.

## **1.7 Outline of the Study**

The thesis questions are explored through an ethnographic study of the matchworks industry in India. The framing of the problematic, contextual and theoretical resources, the data and analysis, and final thematic and thesis conclusions are set out in three sections and nine chapters.

Section one raises important questions on problematizing workplace knowledge in India and is composed of four chapters. Chapter One outlines the contours of the overall project. Chapter Two introduces the reader to a more detailed account of the non-formal sector in India and the Matchworks Industry. Chapter Three locates the importance of workplace learning in the context of an unusually high informal sector in India, as well as the relevance of learning theories in a project of this kind. It also raises the contextual definitions of work and work-related dimensions in policy frameworks. Chapter Four deals with the philosophical underpinnings for the research and the methodological considerations for framing the research. The methods and their ethical implications are also elaborated in this chapter. A largely qualitative approach with ethnographic tools is adopted which uses an extended case methodology to do justice to the nature of workplace research.

Section Two is composed of three chapters. Each explores an aspect of the workplace and learning through the narratives of the workers. Drawing on vignettes of workers, and giving them a 'voice', Chapter Five analyses the valorising of skills in the workplace. Chapter Six places formal models of skill acquisitions against the prevalent hierarchies in the match work places. It also introduces the variable of automation and addresses questions of changing value of work. Chapter Seven

encounters discontinuities in the traditional workplace demographics and abstracts the workplace into an extended non-local spatial. The chapter also illuminates women-working and their adaptation to technology towards challenging dominant workplace models.

Section Three is composed of two chapters. Chapter Eight reflects on the overall themes to emerge as findings of the study. Chapter Nine draws the study to an end by offering a set of conclusions regarding the research questions and findings, methodological issues, policy recommendations and implications, and finally a possible agenda for future research in the informal sector in India.

## **CHAPTER TWO**

# **The Informal Work Sector of India as a Context for the Matchworks**

### **2.1 Introduction**

An understanding of workplace learning and relations in the Indian matchworks is not possible without placing it in the context of its socio-historical and political landscape. In this chapter, I trace the historical trends of this landscape in the context of India, focusing on: a) the informal sector and its coexistence with the formal sector of work; b) how the sector has shaped policy direction with respect to apprenticeships, worker training and employability, and c) the context specific issues of the matchworks that make it an ideal case study to represent the research opportunities at the intersection of the informal sector with workplace learning concepts discussed in Chapter Three. There are two concurrent themes that run through the chapter: the nature of the informal sector, and the politics around its inclusion at the local, national and supranational levels. The differentiation between formal, informal and non-formal is with the learning processes, discussed in Chapter Four, but the sector differentiation is on the formal/ informal, keeping with the common usage in policy and practice. The chapter introduces the matchworks - with their unique historical context and employment trends straddling the formal-informal continuum.

### **2.2 The Formal/Informal Labour Landscape**

The ILO (2014) gives out the definition of Informal labour as including all economic activities by workers and employing businesses that are:

- not covered or insufficiently covered by formal arrangements.

- not included in the law;
- operating outside the, formal reach of the law;
- not covered in practice (although they are operating within the formal reach of the law);
- not enforced by law;
- discouraged by the compliance with the law because it is inappropriate, burdensome, or imposes excessive costs.

There are two fundamental asymmetries that we see in this divide/continuum. The first is the definition-led categorization of what constitutes the formal or informal. The second is the disproportionate size of the informal economy in comparable developing economies.

The problematizing of work varies amongst authors. Braverman (1974) looked at work as a formal activity and addressed the question of the “deskilling” of the worker due to automation, and as a result of a Taylorist expansion of work resulting in separating the worker from the production. Sennett (1998) broadly agreed with Braverman regarding the separation of work from production, but he was more concerned with the meaning of work changing over time, and the growing precarity of workers. Both views span the spectrum of formal-informal, even though Sennett’s prediction is closer to the one that I am concerned with.

At the peak of formalizing work we see, almost a reverse trend where, primarily due to economic restructuring, an expansion of the informal economy begins to be seen (Portes and Sassen-Koob, 1987; Portes and Castells, 1989). In most cases, the formal is advantaged in that it is largely regulated by the state, and possibly by the unions. But it can also be burdened by the costs of meeting the regulatory requirements. A question then arises: does the lack of regulatory control imply informality? Narayana (2006) put the contrast in an interesting way whilst describing Indian enterprises. The formal (or informal) sector comprises regulated (or unregulated), organized (or unorganized) and registered (or unregistered) enterprises. I argue that in all cases, formal and informal are not the opposites. Rather they can be placed on a continuum, with particular events or indicators categorizing one as formal and the other as informal (Lipton, 1984). The dichotomy becomes clear at a policy level when

there is need to categorise one set of actions against the other. If one were to take the position of labour and look towards policy, a different continuum emerges. The formal engages with the informal and the informal exists within the formal (Bremar, 2013).

Loayza (2016), in a paper for the World Bank on developing economies, suggests a definition of informality that also takes into account (the absence from) the formal economy. He says that 'informality' is used to describe firms, workers or systems that are either 'excluded' or have 'exited' the formal sector. The matchworks aligns with the 'excluded' view, with an increased distance from the formal in areas such as employment and training, whilst nonetheless being shaped by pressure from the market. The World Bank's official line on informality, as a definitive indicator of *economic underdevelopment* (Loayza, 2016, p. 4), is also contested in this case. Informality is not connected to (the presence of) regulatory control but to the nature of work, the flexibility of the process (outside of defined formal workplaces), and the choice of the individual to do piece-rated work or even take chunks of the work home. Paradoxically this kind of 'informality' assists the economic status of the women workers in a positive manner in that they do not need to have acquired training or to be governed by a formally-organised week. This is a contra-position to the World Bank's assumption; that is, that all cases of informality may be sources of economic backwardness or put more strongly, retardation (see Vignette of Kanakam in Chapter Six).

The 'formal' is associated with the 'structure', and is summarized by, a) the degree of official governance, and b) the degree of structuring, thereby providing a summary of the diverse definitions in the literature (Agarwala, 2008). The first is the extent to which it interacts with, or comes into the net of, the structures of official governance at the national, regional or local levels. The second dimension is the extent to which an activity can be performed within the parameter of a set of predictable frameworks. The emerging realities of *organized* sector employees having *informal/unorganized sector practices* has become common, as analysed by Portes and Castells (1989), or in the textile mills of India (Bremar, 2013). Can we then

expect to see the differentiation, as a stark divide between formal-informal (or organized-unorganised) sectors? How does this conceptualization play out in other countries/contexts?

Production Units by type	Jobs by status in employment								
	Own-account workers		Employers		Contributing family workers	Employees		Members of Producers' Cooperatives	
	Informal	Formal	Informal	Formal	Informal	Informal	Formal	Informal	Formal
Formal Sector Enterprises	M	M			1 M, S	2 S	F		
Informal Sector Enterprises	3		4		5	6	7	8 M	
Households	9				M	10			
<b>Categories of MATCH Production Units and their indicative alignment to the Formal-Informal sector continuum</b>  <b>M- Manual</b> (Where all the operations are manual)  <b>S- Semi Mechanised</b> (Where the manual processes co-exist with the automated processes)  <b>F- Fully Mechanised</b> (Where the automated process is run with trained manpower and with some employment formality, with respect to qualifications)									
1. (a) As defined by the Fifteenth International Conference of Labour Statisticians <sup>7</sup> (excluding households employing paid domestic workers). 2. (b) Households producing goods exclusively for their own final use and households employing paid domestic workers.  Note: Cells shaded in dark grey refer to jobs, which, by definition, do not exist in the type of production unit in question. Cells shaded in light grey refer to formal jobs. Un-shaded cells represent the various types of informal jobs.									
Informal employment:					Cells 1 to 6 and 8 to 10				
Employment in the informal sector :					Cells 3 to 8				
Informal employment outside the informal sector:					Cells 1,2, 9 and 10				

Figure 2.1: Framework for the Formal-Informal Economy applicable to the Matchworks Industry (adapted from Hussmann, 2004).

Understanding the idea of a 'formal' work sector helps us understand two aspects of this study. The first is the relation between the informal and formal economy, and the second is the assumption shaping vocational education that all labour is, or should be, formally organized and supported by vocational training. Where might we

<sup>7</sup> The 15<sup>th</sup> International Conference of Labour Statisticians (15<sup>th</sup> ICLS) adopted an international statistical definition of the informal sector. ILO (2004): Working Paper 53.



place 'subcontracting' and 'homeworking' – two modes of working and learning, which lie at the centre of the match ecosystem? I use Hussmann's (2004) framework to locate the constituents of the matchworks, and its sub-categories of manual, semi-mechanized and fully mechanized, to examine its work processes on the formal-informal continuum.

As can be seen from Figure 2.1, the informal and formal have to be seen in relation to each other so as to understand how each can affect the other. Agarwala (2009) suggests a 'relational' definition of the informal economy, which is based on the 'interactions of the informal workers, with the formal economy via structures, networks and political institutions' (p.315). She argues that several countries, particularly those in post-independence phases, have built their theoretical structures independent of 'social relations and the institutions of power that link them to their previous colonisers (pp. 319). Consequently, the notions of the informal economy as a temporary space before migrating rural populations settled into formal employment in urban areas, may need revisiting, as we will see in the examples below.

### **2.3 Wider Conceptions of Informal Work**

Many studies of work and the workplace in India, as well as globally, have emanated from the International Labor Organization (ILO: 2004, 2013) and The World Bank (Clarke, 2003) who, in recent years, have begun to support those that examine the changing boundaries around the concept of work. There are two distinct, but connected, tracks: a dominant historical-local, and a wider formal-political form of labour classifications. These are connected to each other, and it is difficult to understand and explain one without the other. As discussed in Chapter One, any study of vocational education or training has to situate itself inside a larger discussion of the informal economy, and the vast swathes of informal sector employment. Yet at the same time it needs to also stay connected to larger trends evolving at a supranational level (Kuala Lumpur Declaration, 2015). The informal

economy has been traditionally restricted to those areas that were not under the formal purview of economic activities (Hart, 1973). In many cases it was linked to (largely stereotypical) occupations outside of industrial or manufacturing activity. It was not until the 1970s that research began to take notice of the diversity of informal work and its co-existence with the formal economy (ILO, 1972, work in Kenya; ILO, 1974, work in the Philippines).

The International Labour Organisation (ILO) has also referred to this informal sector as the 'unorganised sector' (ECOSOL- Glossary; ILO, 2002). It is variously referred to as the 'hidden sector' in Turkey<sup>8</sup>, the 'vulnerable sector' in Philippines<sup>9</sup>, and as the 'underground sector' in Brazil (Barbosa Filho, 2012). There are, however, sub-categories of this sector that are relevant to this study. Researchers have refined the concepts, particularly in work related to developing economies, and identified differences between the informal, the unorganized, and work related to petty production (Papola, 1980; Cawthorne, 1993; Hariss-White, 2004; Breman, 2013) which, together, characterize an estimated 93% of the Indian economy (ILO, 2002; NCEUS, 2006).

Barbara Hariss-White (2004, p.17) qualifies this number for India, as fitting into a range of between 83-93%, which is based on NCAER<sup>10</sup> estimates, and the residual number from the organized sector estimates. The absence of accurate reportage of the numbers is by itself a primary indicator of the shapelessness of the sector. This sector in India, characterized by the lack of any consistent data collection over regular periods of time, or *time series* information (Mitra, 2013, p. 25) in statistical reporting of a segment of the working population, is 'informal' and is defined by *what is not there*. In other words, it refers to the invisible nature of, and thus non-inclusion of, identifiable details of the workforce, like employment, its benefits, and the nature of workforce deployment. The commonly used terminology for the informal sector in Indian policy references is also the ILO's definition of the

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<sup>8</sup> <http://dergipark.gov.tr/download/article-file/9280>

<sup>9</sup> <http://www.ilo.org/manila/areasofwork/informal-economy/lang-en/index.htm>

<sup>10</sup> Established in 1956, The National Council for Applied Economic Research is India's think tank on economic policy research. Its reports can be accessed at <http://www.ncaer.org/data.php>

‘unorganised sector’, and informal workers are referred to as ‘unorganised’ workers in all manpower reports by the government (NCEUS, 2006). Informal can equally apply to the form of organization but also to a set of activities, as they are carried out independent of more bureaucratically organized activity with specific rules and procedures.

Offering a different perspective, Breman (2013) argues that any comparisons of the informal sector of the workforce in a developing context like India, are hampered by being categorized as either agrarian-rural, or industrial-urban. He argues that the informality of work is not related to the type of activity but the ways in which it is practiced (2013, p.28). This raises an important question of how policy characterizes work, and what exactly is the means through which work is identified, defined and measured when policies are rolled out within nation-states?

Notwithstanding the high numbers seen in India, the alarm is also being raised in other countries that are either transition economies or those economies who have begun to recognize and address the unique challenges of this ‘formal-informal’ divide. In Turkey, for example, the size of the informal sector is estimated to be at 40%. Similar to other countries, the methods of estimation for Turkey’s informal sector are seriously contested by economists as well as by researchers. Regardless, recent work is based on a strong statutory push towards the formalization of labour. Baslevent and Acar (2015) segment the informal sector in the rural areas at 41% as compared to the 25% in the urban areas (2015, p.82). They also report on an interesting trend in the informal sector; the largest group being those aged 25-44 years. Additionally, they also found strong correlations of poor or no formal education with informal work. This affects women the most; 56 % women workers had not completed high school. One caution from their research is that there may be variations based on the nature of occupations.

In Malaysia, key government reports do not directly refer to the informal sectors of the economy or its workforce, including the flagship National Employment Returns (NER, 2016). A closer read of the same report, however, reveals the possibility of hidden numbers, as the survey is sample-based and may have excluded certain

categories of the workforce, as well as employers. A research paper tracing the economics of the informal sector in Islamic countries like Malaysia, Malek and Arshad, without confirming any number for the sector, reiterates the need to look at derived numbers in the absence of formal reporting (2017, p.286). Their study, which examines ways of measuring the sector, traces the politics of categorizing the workforce, and how these might impact eventual size.

The ILO's country-wise reports for other ASEAN countries have been more helpful in arriving at a number, notwithstanding the contestations in the calculations. Vietnam has a 23.5% of informal employment that excludes the agricultural sector where the estimates are at a much higher 48%<sup>11</sup>. In Philippines, the range is contested, sitting between claims between 38.3%<sup>12</sup> and a high 80% – and in this case also referred to as 'vulnerable employment'.

In China researchers have traced the contours of the informal nature of the workforce and what gives it its shape. Xue, Gao and Guo (2014: 85) studied the rural to urban migration of labour during China's explosive economic growth following the reforms of 1978, and the corresponding increases in the informal worker populations. They reported an increase in this category from 62 million in 1993 to 159 million in 2011. Based on another set of studies (Wu, 2009) around 60% of the rural-urban migrated populations were reported to be informal; even as an approximation, the size of the informal workspace with its various forms could be significant.

It was Keith Hart's work (1970, 1973) in Ghana that challenged existing views; that informal workers stayed on the fringes until they were absorbed in the formal sectors. Based on his studies in the capital Accra, Hart found that informal workers existed (and even experienced economic betterment) in the newer arrangements

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<sup>11</sup> ILO Hanoi, "Informal Economy," accessed at <http://www.ilo.org/hanoi/areasofwork/informal-economy/lang-en/index.htm>

<sup>12</sup> ILO Manila, "Informal Economy," accessed at <http://www.ilo.org/manila/areasofwork/informal-economy/lang-en/index.htm>

that were parallel to mainstream formal economy, mostly through avenues such as self-employment. When these informal arrangements grew in scale, they attracted others who were 'formally' employed by the informal sector entrepreneurs into businesses which provided cheaper goods and services to urban consumers fitting into the opportunity gaps where the formal services were either unavailable, or simply too expensive.

It was following this conceptualization that the informal economy gained wider attention and started a different conversation. It also meant that the formal stayed with the informal in a necessary but contingent relationship. Economic sociologists, following another milestone work by Portes and Castells (1989), included urban and rural segments into their study categories, and in doing so revealed an intricate and complex set of interdependencies between the state of the formal and the informal economies. A large part of this study affected labour studies, particularly drawing attention to the non-economic areas of social relations.

Hart's description of the informal economy, almost as a synonym for self-employment (Barbosa Filho, 2012), also came to be referred to as an underground economy in countries like Brazil, where its existence was neither accepted nor denied. Barbosa Filho estimated 22.8% of the country's labour was in the informal sector (p.9) which, when combined with self-employed workers, increased substantially to 38.7. Interestingly, the informally self-employed could own a small firm that also reached into the 'formal' economy.

## **2.4 Work in Post-Independence India**

In the immediate post-independence period, the informal workforce in India was estimated to be some 2.5 million (Ornati, 1955, p.9); this can be compared to estimates in India now of well over 200 million (Chandrasekhar, 2014). To see this in perspective, the total employment in the country at the end of the Twelfth Five-year Plan (2012-17) was 472 million, out of which formal employment was around 47

million. Chandrasekhar (2014) concludes in his analysis that more people entered the informal sector than the formal sector, even as the employment sector overall grew from 2004-05 to 2011-12 by an estimated 15 million. The looseness of the approximations around the actual numbers is a compelling reason for studies of this kind.

With industrialization and an accelerating economy in India, a large proportion the *informal workforce* has at least in policy and productivity terms been pushed to the shadows. I call it ‘the shadows’ because of it has very limited visibility in the way it has evolved and also is ‘seen’ today. It is not to be confused with the invisibility from the administrative mechanisms referred in the earlier paragraph. There are also large tracts of learning and experience that have either stayed in Jurassic Park-like isolation, or been buried in the accumulation of studies and reports for policymakers (NSDC district wise report, 2013; see Section 2.5 of this chapter).

For example, the workforce report for the districts in which this study has been conducted is widely off the mark compared to the estimates this study has gathered. Whilst the common refrain has been rhetorical, that is on how the capacity for skills needs to be increased (ibid), relatively less attention has been paid to the content, pedagogy, interfaces of learning-application, or accreditation. Of concern, also, is an emphasis on ‘majority’ skills - that is, areas which seem to produce large scale numbers, like the construction, technology or retail segments (NSDC: Projections) and the related capacity-building imperatives, including content creation, trainer alignment and pedagogies.

The new India skills policy (NSDC, 2015, p.9, Section 2.13) has acknowledged the difficulty of being able to assess the informal/unorganized sector of the workforce, but has at the same time confidently predicted that the growth in demand in the informal sectors would be double its current size! Despite acknowledgement of the sizeable informal work sector, the policy on the skills framework is silent on any approach that might then include this sector in the proposed initiatives. As an example, there was only one mention of Recognition of Prior Learning (RPL) (p.22;

Section 4.3.10) which is, in a strict sense, not representative of the training required/recognized in the informal sector. I subsequently explored this aspect in my research (including interviews with policymakers) and report on this in Chapter Eight of this thesis.

At this point a comment on the historical trends would be useful to understand why the informal sector of the work force represents an unusually high number for India. In post-independence India (after 1947), there was a similar pattern of organization to what had already developed in the West, which had an element of formal definition in all policies that were framed both for industry and the labour (Raj, 1993, p. 211). This led to (forcibly) fitting practices into existing definitions. This does not always serve the purpose of either examining the categories from a practice perspective, or indeed reflect accurate reporting so as to measure policy effectiveness. The policy, from a colonial perspective, generated significant absences in local practices. Expanding on the assumption articulated by KN Raj, an economist, Breman (2013, p.213) comments on the distancing of the objectives from the historical conditions that shaped the working class in this part of the world; that is India, and to a large extent the colonial geographies of south-east Asia. The “universalist view” of the working class, and the social dynamics of the workforce particularly in the non-urban, non-agrarian, non-formal environs of the industrial work (Pant, 1965, p.12), was thus hugely stereotyped. These stereotypes were reinforced by policymakers, and by post-independence governments. It is pertinent to ask whether these need to be revisited for current policy-practice understanding?

Singh reported on the colonial hangover of TVET frameworks (2001) and traced how indigenous crafts and skills were distanced from official narratives that were seen as alien to the social and cultural milieu of the country (Singh, 2001). After independence in 1947, this legacy strengthened, inadvertently leading to the neglect of informal skills, as policy equated employment with formal qualifications thus relegating vocational education and training to playing second fiddle to higher and secondary education. Within this, the informal and non-formal acquisition of skills found even narrower spaces to operate within.

Even in policy over the past few decades, the default assumptions – shaped in no small measure by their binary view of the urban-industrial/rural-agrarian divides, continued to be accepted in the minds of policy makers whilst discussing the migration of labour. To an extent this is true in the unskilled segment where agrarian labour tends to migrate to the city. But the comparison to industrial work is, I suggest, a distant notion from the realities of the current workforce segmentation. Migration has a particular spatial pattern in the matchmaking context that is reported and discussed in detail in Chapter Seven.

How does one access information on the informal sector; and are there ways for policy makers to draw from/ contribute to more robust and more accurate data? The current sources of formal data (including the National Sample Survey detailed in this chapter) are currently limited to meeting macro-economic needs but stop short of informing policy implementation. Several players position themselves in this spectrum of data: the localised researcher, government employment exchanges at the district or provincial level to the national level data organisers like NSDC (see Section 2.5) or the various bodies of the Ministry of Statistics and Programme Implementation.<sup>13</sup> There doesn't seem to be a satisfactory answer. Commenting on the multitude of players in the sector but faced the lack of a definitive source of information or research in India, Matthias Pilz calls for a dedicated research centre of the kind that the European Union has in CEDEFOP<sup>14</sup>, or the European Centre for the Development of Vocational Training (Pilz, 2016, p.17). CEDEFOP has served as a research centre for aligning important aspects of vocational education, research and practice. It brings together governmental agencies and influences policies across the Member States of the European Union, and in some cases beyond the continent. Knowing the skill/policy/research landscape in India and comparing it with CEDEFOP whose research I have had an opportunity to access as well as participate in

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<sup>13</sup> <http://www.mospi.gov.in>

<sup>14</sup> <http://www.cedefop.europa.eu>



regarding deliberations and workshops<sup>15</sup>, the institutional support structure of the kind that CEDEFOP provides would certainly assist policymakers and policymaking.

While not completely disagreeing with Pilz's comments above, Renana Jhabvala and her colleagues Rathna Sudarshan and Jeemol Unni (2003), in the course of doing extensive work in the informal sector, acknowledge the increased amount of empirical work in the informal sector since the 1970s. They believe their work has 'made visible' a number of occupations that would not have been otherwise included in the informal sector (2003, p.21).

In pursuit of unraveling the relationship between large, small scale, and artisanal production units in developing countries, researchers like Isa Boud (1993) have differentiated a generic informal sector approach from that of petty commodity production (p.81). However, subsequent sociological research by Patel (2016) in similar environs as Boud (1993) and Ranganathan (2017) has strengthened understanding of the systems of 'petty production' within the informal sector. They also agree with Moser's definition (1978) on what constitutes the nature of the informal sector units. So what makes the petty-production concept useful for this study? The matchworks, spread across the formal-informal continuum, and based on the size of the production unit, also includes the petty-production models in that they are applicable to family units at the informal end of the continuum where the impact of automation is also limited.

## **2.5 Organizing Workers' Training in India**

The Indian Government has an established mechanism for nodal control of skill development through the National Skill Development Corporation, a public-private enterprise to galvanize the capacity building of skills through the formation of the Ministry of Skill Development and Entrepreneurship (December 2014). Since its

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<sup>15</sup> <https://ed-gesf.com/2016/12/13/conference-on-validation-of-non-formal-and-informal-learning-a-report-by-nam-peri/>. The researcher has reported on the nature of proceedings in a Research Centre blog at the University of Bristol.

formation in 2010-11 as part of the Eleventh Plan (2007-2012) with an investment outlay of Rs. 228 billion dedicated to skill development (Gol, 2008, p.91), the NSDC (Appendix IX) was focused on capacity building alone. Their remit was restricted to training, and the enablement of entry-level persons. But it is silent on the nature of *vocational education content* as well as on *mid-career retraining*. I raise this as an important issue since the 400 million number mentioned in Chapter One of this thesis includes reskilling (and for the purpose of this study, a re-learning) those with current capabilities.

A significant achievement of the new Ministry, as well as for the NSDC, was the formulation, launch, and dissemination, of the Skill Policy (July 2015). Regarding skill development in India, it is clear it was aimed at emulating more successful ones, like the German model (Euler, 2013). Indeed, the German model has been the subject of comparison by researchers for several decades (Maurice et al., 1986). However, the informality of the sector and its fragmented organization in India means the nature of work may need to be re-framed and re-defined so as to bring a higher level of contextual relevance to this study and its research inquiries.

### **2.5.1 Apprenticeships**

What are the elements that affect knowledge or skill acquisition by a new comer who, by definition, does not know the categories of either formal or non-formal? S/he is both a learner and a seeker of information. In this study I have found myself struggling to commit to one definition of the apprentice, though the reader will see that I settle on a firmer description of the matchworks apprentice as the study progresses. The legal system has a definition in the Statutes (MHRD, The Apprentices Act, 1961). In my study, where there is no formal structure, an apprentice enters as a short-term learner similar to an *angelernte arbeiter* in the German system (Maurice et al., 1986: 70-71), but then ends up being trained and socially recognized as an expert during and through phases of his/her learning. Would an apprentice in a trade guild, like the *Ahi* in Turkey (Unluhisarcikli, 2007, p.116), be the same as an apprentice learning a craft? Does it, as Gramsci notes, reflect his/her personality in

the object of the work, a *la demiurge* (Gramsci, 1971, p.303)? This is essentially taking expertise *as the outcome* and describing the ways in which that expertise is recognised but in very different ways. Expertise is context related, just as the German system gives credit through social recognition, and the ‘hierarchies’ in the traditional *Ahi* trade guilds that are irrelevant outside their context.

An apprentice could enter one of the following segments of work: a) informal work performed in formal environments; b) self-employed tradespersons working at home and outside; c) flex-working women on piece-rate and job-work; or that of d) small time entrepreneurs and job-workers on the periphery of formal employer-employee relationships. The rationale for keeping this set of categorizations without rigid boundaries is to enable me to study the processes of knowledge production that emerge and survive in a non-urban, non-agrarian context of industrial work, which is itself embedded in the fabric of its local and wider social structures and where sharp divides are less visible.

Contrasting bureaucratic definitions in the formal sector with what I am observing might allow us to see where the blurred lines of the boundaries lie with regard to the informal sector, which in many cases are not defined, and thus barely visible. Yet they matter and matter hugely. Bernstein uses boundaries as a metaphor for governing, in that those who govern have the capacity to mark the boundaries to classify, and thus recognize, what counts as an identity, and to also frame what activities this identity is to perform (Bathmaker, 2013, p.91). In vocational education, the classification of boundaries refers to the activities, which in turn allocates a correspondingly distinct social value to the activities. An example of a formal boundary is the one that defines and allocates gender – such as male, female (or indeed transgender though less often) – which then draws these categories into modes of bureaucratic ordering. When the informal sector is not defined through recognized categories, large numbers – in this case women workers – are also un-noticed by policymakers.

At a broader level, the informal or unorganized sector of the workforce is subject to further challenges. The formal framework does not extend to mechanisms enabling the training of newcomers through apprenticeship programmes. The proportion of apprentices in India is an estimated 0.1% of the workforce compared to a much higher 3.7% in Australia or Germany (ILO/World Bank, 2013, p.11). This reality has policy implications regarding building capacity. The number of persons who have received formal training in entry-level vocational employment pathways of ages 15-19 is at a low 2%; the corresponding number of individuals who have received informal training in this category is 8% (National Sample Survey of India, 2006: 61<sup>st</sup> round report, No 517). The subsequent report for 2011-2012 showed a marginal increase in the above categories at 2.2% for formal and 8.6% for informal training (NSS, 2015: 68<sup>th</sup> round, No 566). The alarmingly low number, partly driven by the absence of apprenticeships in the informal sector of the economy, will have to be addressed differently both in the reporting as well as in capacity building measures of policy makers. What can the matchworks reveal of the informal apprentices entering the in(formal) workforces amongst the various categories discussed in Figure 2.1?

### **2.5.2 Credentialising**

In constructing the NSQF (National Skill Qualification Framework),<sup>16</sup> a flagship effort to standardize the skill definitions and taxonomy to international systems of OECD, ILO (Allais, Raffe & Young, 2009, pp. 1-5), the World Bank and the European Union, the Ministry of Human Resource Development of the Government of India proposed a structure to identify recognition of prior learning (RPL) as well constituent characteristics of work relevant to informal work (MHRD, 2013, p.3). This is a crucial step in acknowledging the presence of a large proportion of the workforce, as well to create a mechanism for 'formalizing' informal skills and informal modes of learning.

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<sup>16</sup> NSQF or the National Skills Qualification Framework was, prior to 2013, known as the National Vocational Education Qualification Framework. It was a major attempt to vocationalise education at the secondary level (typically 17-18 year olds) and to make the system accessible to groups that were hitherto not benefitting from it. (Mehotra, 2013:38-42).

Three definitions in the Ministry's document are key to the understanding of informal learning and work in the context of India:

*Knowledge* means the outcome of the assimilation of information through learning. It is the body of facts, principles, theories, and practices that is related to a field of study or work. Knowledge is described as theoretical and/or factual.

*Learning Outcomes*: represent what a learner knows, understands, and is able to do on completion of a learning process. This is expressed in terms of knowledge, skills and competence.

*Skills*: means the ability to apply knowledge and use the know-how to complete tasks and solve problems. Skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments) (MHRD, Government of India, 2013, pp.1-2)

It is pertinent to note that learning outcomes, which must be viewed as different to qualifications, are emphasized in the conceptual paper of the ILO (Allais, Raffe and Young: 2009, p.8). In one of the earliest definitions of 'skill', Renold (1928, p.593) identified mental and physical qualities that, in combination, might be useful to industry. He also stressed the need for training in such skills. Yet it is important for us to understand the social context at the time this definition was made. What is relevant is the social context for the origin and training of such skills (Steiger, 1993). Sennett (p.69) highlights the links between social standing and skills in the old capitalist order. In a changing world of work as a result of technology displacing labour, Braverman describes the worker as alienated as a result of a loss of opportunities to control the acquisition and development of skills (Braverman, 1974). In such a scenario, 'skill capital' is subject to enhancement or erosion in the workplace. Billett (2001, p. 434) argues that an individual's experience of their domain is not restricted to abstract truths passed along for a long time, but it is also shaped by situational factors. Hence, what we know and how we make sense of our experiences is passed on through their networks, whilst also given new meaning in emerging situations. The old and the new sit side by side. None of the qualitative

inputs into any meaningful 'work' outcome is either included or given weight and thus valued whilst constructing the NVQF.<sup>17</sup>

**3.4.3 Age Specific Rate for Formal Vocational Training Received**

Statement 3.21: Number per 1000 persons of different age groups who received formal vocational training during 2004-05 and 2011-12

category of persons (1)	age group						all-India	
	15-19 (2)	20-24 (3)	15-24 (4)	25-29 (5)	15-29 (6)	30-44 (7)	45-59 (8)	15-59 (9)
<b>68<sup>th</sup> round (2011-12)</b>								
<b>rural</b>								
male	6	26	15	31	19	15	10	16
female	7	16	11	15	13	9	4	9
person	7	21	13	23	16	12	7	13
<b>urban</b>								
male	15	55	34	66	44	60	43	50
female	20	48	34	54	41	33	18	33
person	17	51	34	60	43	47	31	42
<b>rural+urban</b>								
male	9	36	21	43	27	30	20	26
female	11	26	18	28	21	16	8	16
person	10	31	20	35	24	23	14	22
<b>61<sup>st</sup> round (2004-05)</b>								
<b>rural</b>								
male	5	21	12	23	15			
female	7	15	11	16	13			
person	6	18	11	19	14			
<b>urban</b>								
male	19	72	45	69	52			
female	18	63	40	55	45			
person	18	67	43	63	49			
<b>rural+urban</b>								
male	9	36	21	37	26			
female	10	28	19	26	21			
person	9	32	20	32	24			

Ref. 1. For the estimates of NSS 68<sup>th</sup> round : Ref. Table 12 of Appendix A  
2. For NSS 61<sup>st</sup> round: NSS Report No. 517: Status of Education and Vocational Training in India, 2004-05

Note: In NSS 61<sup>st</sup> round (2004-05), information on formal vocational training received was collected for persons of age 15-29 years and hence the cells for the age groups 30-44, 45-59 and 15-59 have been shaded.

Figure 2.2: An extract of a Report showing demographics of vocationally (formally) trained persons.

Consider this extract from a Government Report (National Sample Survey, 2006)<sup>18</sup> that looks at credentialising the training in informal workplace. At this point we can also problematize the definitions used in the Report.

Notably, the definitions in the reports, as much as they contain the right intention, do not serve their purpose, and are explained below. The Report (NSS, Chapter Two Sections 2.5-2.8, pp.7-8) elaborates what is included in the non-formal method of training.

#### *Non-formal vocational training:*

- (a) *Hereditary*: The expertise in a vocation or trade is sometimes acquired by the succeeding generations from other members of the households,

<sup>17</sup> In this discussion, I limit the pointers to NVQF but in Chapter Seven, come back to discussing some positive steps taken by the government through the Sectors Skills Councils of the NSDC.

<sup>18</sup> The reports from the National Sample Survey taken as an example here is from the 2006, 61<sup>st</sup> Round, No 517. [http://mospi.nic.in/sites/default/files/publication\\_reports/517\\_final.pdf](http://mospi.nic.in/sites/default/files/publication_reports/517_final.pdf). Subsequent surveys carry similar definitions. The purpose of this study is not to highlight the differences between the surveys; it is to use the similar usage in the policy language regarding definitions and scope for what is included in non-formal vocational qualifications or experience and the gaps that emerge from the current scope

generally the ancestors, through gradual exposures to such works as are involved in carrying out the profession by their ancestors. The expertise gained through significant 'hands-on' experience enables the individual to take up activities in self-employment capacity or makes him employable. These were considered as non-formal vocational training acquired through 'hereditary' sources.

- (b) *Self-learning*: The expertise in a vocation or trade when acquired by a person through his/her own effort, without any training under any person or organisation, was considered as non-formal vocational training acquired through 'self-learning'.
- (c) *Learning on the job*: The expertise acquired by a person while in employment (current and/or past), either through informal training by the employer or organisation or through the exposure to the type of job that he/she was performing, was considered as non-formal vocational training acquired through 'learning on the job'.
- (d) *Other*: 'Other' sources included cases where the expertise for a vocation or trade was developed even from the household members or ancestors, provided the said vocation or trade was different from the one relating to their ancestors.

Here we can problematize two aspects of this Report that are relevant to my study, and which bring Figure 2.2 and the critique of the formal statistics into our discussion. Firstly the categorization above, or the methods of survey - even though they represent a variety of non-formal inputs - are not sufficiently clear to enable policy interventions. Neither do they provide any means of assessing if there is an opportunity to include *those* methods into either enumeration or subsequent intervention.

Secondly, in the formal sector, there exists a body of workers who have used the four classifications named above to perform formal jobs (Breman, 2013, p.29). Breman refers to the 'presence of workers employed on *informal conditions, within the formal economy*' (*my emphasis*). For them, the learning methods are not dichotomously perched in either the formal or the non-formal inputs of training. This is the 'informal sector with a veneer of formality' particular to the matchworks industry. It is this space that I refer to, and thus also problematize, as a policy shadow.

As far as research and policy is concerned, the continuing disagreement on what/how large the informal sector of the workforce is, and within that how a particular sector has to be qualified for study or implementation, has continued to feed the ongoing chasm between a formal-informal dichotomy. Notable empirical works have highlighted, though at different times, the exclusion of certain categories of workforce from economic analyses (Sudarshan & Unni, 2003, p.22), particularly related to labour studies. Of note is the absence of any mention of links to training or apprenticeships in this sector, and how policies might address such absences.

### **2.5.3 Employability**

I attempt to differentiate the discourses on employment and employability in this section and why this differentiation is relevant to this study. At a broader level, the political claims of governments have shifted from employment (traditionally driven by qualifications and one-time skills) to that of employability (ability to stay in chosen livelihood pathways through a combination of skill, learnability and relevance to work environments). Employment in the current context is not employability. It is not the training that provides a pathway to a job. It allows the learner to be able to make two choices: firstly, that of seeking a vocation with commercial premium for her time and value of labour that comes from such learning; and secondly, demonstration of a set of individual attributes that are relevant to the individual seeking employment (Yates and Grumet, 2011). Yates and Grumet particularly comment on employer-led training that focuses on a relatively narrow objective of creating their own labour pool, which in turn generates employment but not employability (p. 7).

This difference in conception, between the training provided towards a particular form of employment through specialization, and a more holistic approach of preparing individuals for the changing needs of work in general, that makes them employable over a period of time, is important. The relevance for the individual is that they are not viewed in some abstract way, as simply a set of skills, but as workers able to anticipate and manage changes in the workplace so that s/he can in



turn adapt to these changes. Employability thus goes beyond the moment of the success of getting a job. It is the process by which the person obtains employment and *continues* to be relevant to the job over a longer window of time. It is both intrinsic to the individual and external to the job itself, and its surrounding environment. The nature of the work process thus includes changing technology or automation that requires retraining the individual, as well as the physical, emotional or knowledge demands that she needs to be equipped with throughout the duration of the employment.

The performative nature of being gainfully employed as manifest in a contract of employment, refers to the skill of the individual. Contemporary human capital theories have led to this 'skill' being regarded as a constant with respect to a particular job. In a changing workplace, this assumption is no longer valid, with the varying demands on skill creating a tension in the contract of employment. Partly the consequences of redundancies are due to this, even as there are grounds for the causes being external – including economic or technological changes. There is some basis for the individual being also unable to learn a new skill or even upgrade her skill to newer work requirements.

Let us look at the changing focus from employment to employability from the perspective of the policy regime in India. NSDC, as already discussed, has begun to play a key role in the assimilation of the number of people being trained, and in the dissemination of policy interventions regarding qualifications and training. This gap in reportage is accentuated by a very interesting problem; that the employable population in the country will be in the range of 70 % of the population by 2025. This is the highest for any country in the world (Pilz, 2016, p.16). There is political direction to this that is provided by the current government (Skill Policy, 2015). But a potential pitfall for the *demographic dividend* - as this perceptible advantage is being referred to - is the large population of the employable population that needs to be formally skilled (Mehrotra et. al., 2014) in a relatively short period that the government announced (Chapter One: Introduction). Even the NSDC, as the emerging nodal organization to channel the skill development efforts (presumably

by its recent reorganization and charter<sup>19</sup> (Nanda, 2015), seems to focus on the 'formal' part of skill development. In other words, the efforts of governments to ensure that people get employed is now shifting to people staying employed with training and skill development, and from shifting supply-led capacity (from the labour market) to one that is demand-led (from employers). It remains to be seen if capacity building can include the large swathes of the employable population that are in these shadow spaces of the informal sector, even as the government has accepted a revised and now lesser number, of some 150 million, who would be demand-driven rather than supply-driven (Outlook Newspaper, 2017<sup>20</sup>).

#### **2.5.4 Vocational Learning**

Alongside the debates on the formal/non-formal sectors of labour and the economy, vocational education in India - as much as in other countries - has come into the spotlight. This is primarily because of the direct correlation of vocational education and training (VET) to employability and the perception that skills enable transitions into the labour markets (Bruges Communiqué, 2010; EU Draft Council Report, 2015, Section 2.1). Several countries have scrambled to include Vocational Education (VE) and Vocational Training (VT) into curricula of high schools (Victoria State Government: 2015) and not only as elements of continuing and Adult education. VE/VT that was traditionally viewed as post- compulsory education, leaped across boundaries to find place in curricula of schools, government training and employment communiqués, and even manifested as commercial training offerings for international students (Malaysia Skill INVITE, 2014)<sup>21</sup>. TVET or Technical Vocational Education and Training arising out of post compulsory education has been accorded a place in the debate on research as well as given importance due to

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<sup>19</sup> <https://www.livemint.com/Politics/roA1I1gM36x1rcCIZcRB6M/NSDC-exits-may-have-been-skills-development-ministrys-call.html> .The report suggested a government review of the low numbers trained but not placed into employment: 5.51 million people in last six years but only 2.35 million trainees placed in jobs, a hit rate of 42.6%.

<sup>20</sup> <https://www.outlookindia.com/website/story/government-abandons-goal-of-training-500-million-people-in-new-skills-by-2022/299252>

<sup>21</sup> The Malaysian Government's programme on Skill Development offered an international programme based on the Skill Qualificational Framework and offered courses in 21 sectors upto a Level 5 Advanced Diploma. INVITE Brochure dated 7<sup>th</sup> June 2014. <http://www.skillsmalaysiainvite.gov.my>

its status as an economic enabler (UNESCO, ACET Kuala Lumpur Declaration, 2015). Several countries, those with established economies and others with the intention to develop theirs further, have embraced vocational education - with its several tributaries of informal, non-formal and apprentice-based education systems. Increasingly, even those nation-states that have a focus on the vocational systems that are primarily restricted to a few trades are looking to expand the policy scope to include a broader spectrum of skills. An example here is the Wolf Report in the United Kingdom (Wolf, 2011). The increasing attention and semi-constitutional success of agendas, like the Bologna Process, reflect a changing mindset about the value of training outside of the formal education system leading to employability (CEDEFOP, 2015, 1). Even though the increasing national and supra-national attention on TVET has made a positive impact, there remain inequalities and imbalances within this sector in many nation-states (Unwin, 2015, 15). Similarly, an unintended fallout of 'formalizing' TVET initiatives through certification has created tensions between the accreditation of existing skills and the traditional learning model through apprenticeship (ibid).

India has had its own journey of vocational education, which on occasions has joined wider the global shifts, but mostly crafted its own path. This path started with the historical reliance, historically, on apprenticeships that were legislated (Apprentice Act, 1961) and for several decades served to supply entry-level labour to manufacturing Industries. The effectiveness of this legislation began to wane after economic liberalization in 1991 (Mehrotra et. al, 2014).

VET Studies relating to labor outcomes (Shavit & Muller, 1998) have highlighted two areas that could enable students of VET into employment within the desired labor market outcomes: the time duration of the course, and the occupational specificity of the training, including employer participation (Ahmed, 2016). The labour market outcomes themselves are a function of rapidly changing technological and workplace and are redefining the skill requirements (Winthrop, McGivney & Adam, 2011). Figure 2.3 shows how the vocational education pathways are linked to the other academic pathways. Noticeably, there are no multi-entry multi-exit pathways, or

alternatives via which the individuals could choose to change from Academic, Technical or Vocational streams.

A summary of the issues that emerge from the discontinuities in the formal and non-formal frameworks is shown in Table 2.1. The horizontal row is a categorisation and indeed an identification of what is missing. The vertical rows reflect formal categorisation at the political level, and how they are recognised, led by the dimensions in the first column as you go down the rows.

	<b>FORMAL FRAMEWORKS (REGULATIVE)</b>	<b>INFORMAL/NON FORMAL INTERPRETATIONS or REPRESENTATIONS (PERFORMATIVE)</b>
<b>Skill and Expertise</b>	Definitions-led	Performance-led Recognition of Prior Learning (RPL) <sup>22</sup> Usage disconnected from macro-definitions
<b>Methods of Measuring Expertise</b>	Standardised methods, formal and decontextualized Quantitative	Localised, Socially-generated Qualitative

Table: 2.1: Forms of categorization of frameworks and how they are differentiated

In Chapter Three, this conceptualization is carried forward adding on the role of workplace learning theories to substantiate the research gap. In considering Table 2.1 we can form a view of the formal frameworks from the first column, the interpretations of practice that exist in the second, and then relate to the formal definitions that appear in the first. Table 2.1 could be put on top of any of the industry that operates alongside, or mingles with, the informal sector as well as making visible the workplace learning dimensions stated in the introduction.

## 2.6 The Matchworks Industry as a Case Study

Why should the match industry be studied to understand vocational interfaces with the informal economy? For one, it is a traditional industry, historically traced from

<sup>22</sup> The question arises of how/where the RPL currently exists in the policy. In India, the Sector Skill Councils (SSCs) of the NSDC have taken the lead through the Qualification Packs-National Occupational Standards, and incentivized RPL (in 2018 it was pegged at Rs 2200). However the process, as much decentralized with the SSCs, still is based on a 'formal' credentialisation. <http://www.sscnasscom.com/efficacy/pmkvy-20/recognition-prior-learning-copy/>

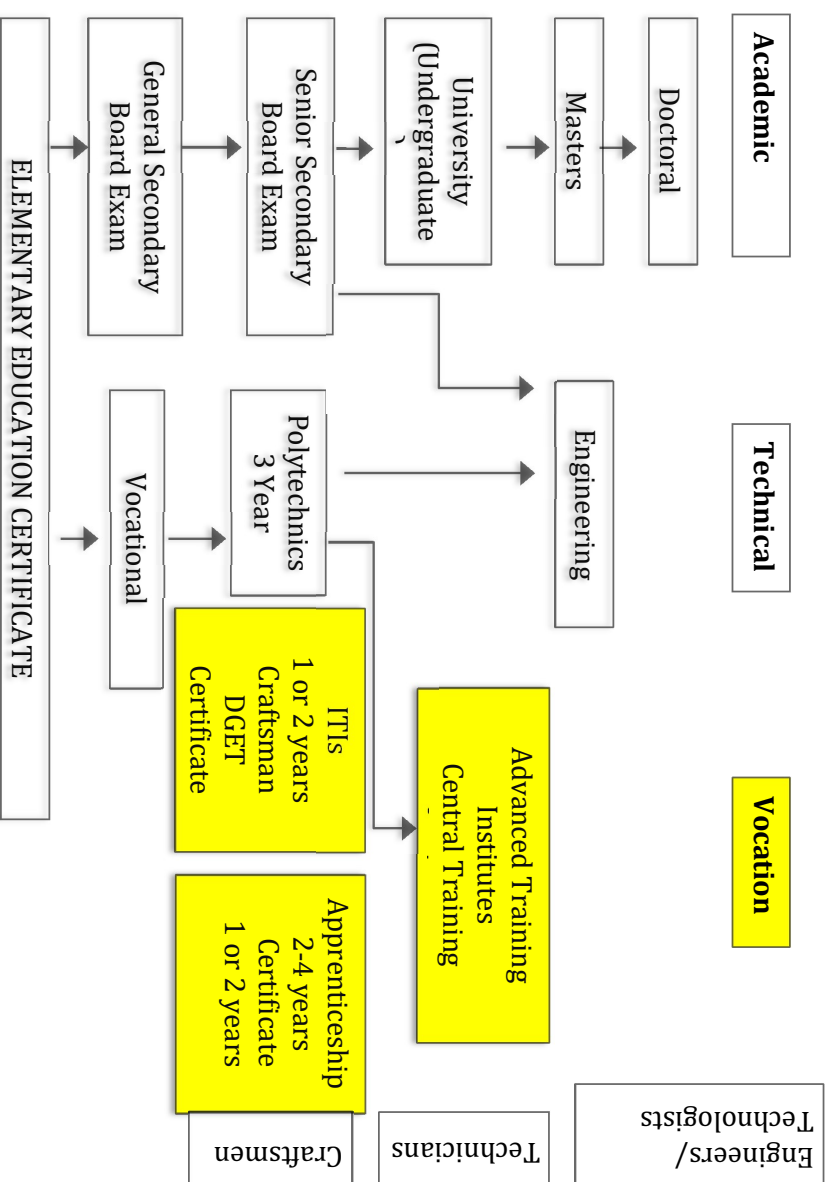


Figure 2.3: Vocational Education System in India (adapted from World Bank, 2007, p.35)

the industrial revolution and continuing to exist despite technological changes and without much change in the manufacturing process itself. Secondly, in an Indian context, it represents all the gaps highlighted in Sections 2.5 of this chapter. In addition, and from a researcher's perspective, it has not attracted much effort in understanding its training or apprenticeship practices.

Two papers (Moulik & Purushottam, 1982; Chandrasekhar, 1997) focused on the commercial aspects of the match industry, and the subject of child labour (now ceased), respectively. Takashi Oishi (2004) writes on the historical situated community-based trading of matches during the first quarter of the twentieth century. Though there is an overlap of the years in which the operations were set up in the locations covered in the current study, there is no mention of the same in the paper. A more recent paper by Hilding, Swain and Vidyasagar (2011) focused on technological changes and the impact of technology on a decline in the trend to the use of child labour. From the perspective of this study, there is very little contribution towards the workplace learning.

In addition to economic upheavals that the industry seems to have weathered, its workplace dynamics and its coexistence with manual-automation work calls for a deeper study. In addition, the opportunity to witness the local-historical in tension with the non-local economic makes the various workplaces of the match industry a possible indicator of how learning models can usefully be taken from informal spaces. Geographically, the industry is still recognized as clustered around Sivakasi, in Virudhunagar district of Tamil Nadu where its historical evolution began. During the colonial period of around 1922, two entrepreneur-brothers learnt the trade from Japanese collaborators in Calcutta (now Kolkata), which was the centre for matches in the late 1800-early 1900s (Oishi, 2004), and set up units, or manufactories, in the district. The arid region of Sivakasi, and the neighbouring areas which were - until then - unsuitable for any agricultural output, proved to be a boon for the industry. The high level of humidity, dryness, and lack of rainfall are all ideal for the manufacture of matches. Very soon match units cropped up in the neighbouring Kovilpatti and Sattur; Gudiatam, some 200 miles to the north, in Vellore district,

picking up the trade and the manufacturing of matches sprung up in the vicinity of the town and the nearby villages forming a second cluster. Most of these were in the unorganized or informal sector. Larger units, primarily run by the fully automated multinational operations of WIMCO - The Western India Match Company (owned by the then Swedish Match), in five urban locations, were the only ones for many years in the organized sector (Moulik & Purushotham, 1982).

Smaller units also existed in several other places, like Hyderabad, further north from the current locations. But they did not survive for more than a decade of operations. The irony of the trade is that their manufacturing survived in the most unexpected places - far away from raw materials and the large markets of the country. By the 1990s, several units across the country ceased operation, whilst the new management of WIMCO saw merit in reducing their own operations and sub-contracting work to the smaller units, shifting into the unorganized category. The commercial analysis relating to the industry, whilst affecting the nature of operations at a macro-level, is outside the direct scope of this study, but is invoked here to illustrate the contingent nature of the changes in the industry over time. The industry and its typical workplace, however, have so far not been subjected to formal research from a sociological perspective.

About 300,000 workers are employed across the three categories of matchworks - manual, semi-mechanized and fully mechanized (see Appendix for the Matchworks Process). This number varies greatly from the unreported numbers of the informal workforce not appearing in the NSDC's formal numbers for the chemical industry - the closest sector to the matchmaking jobs. In any case, the number is not much higher, when compared with reports of a quarter million in the last two decades (Tandon, 1991). An estimated 225 units in Sattur, 210 in Sivakasi, 215 in Kovilpatti, and 180 in Gudiyattam, are prominently reported from the four big centres. These are spread across the segments of cottage (manual process), semi-mechanized, and fully mechanized units.

Even with the strong justification from an industry perspective, where there is no sociological study done so far, I posed myself a reflexive question: why would these village-clusters represent the ideal setting for this study? In what way is this representative of a larger trend? The answer is clearly the reason why only these two clusters exist today. With increasing global competition, the units in these two locations continue to innovate, manage their labour pool, and stay competitive not only in the local markets but also in the export markets. At the same time, the mechanization that is associated with economies of scale is not only visible in the medium term, but it has also taken shape with considered prudence. This contradiction was evident even in my initial interactions (pilot study) with an owner-manager of a match factory when he stressed the need to maintain labour-intensive operations.

I related this situation to the automation-labour balance that pioneer large-scale match makers like Bryant and May adopted in the United Kingdom in the 1880s (Arnold, 2011, pp.618-620). After my pilot, I was convinced that the knowledge production process and its continuation in these clusters could shed light on how such firms in other work-segments could play a significant role in contributing to vocational learning. The various facets of learning and knowledge production central to the clusters have generated their own livelihood alternatives for several decades now. Implicit in their survival is evidence of unique knowledge production and transfer processes, across temporal, spatial and even technological boundaries, which could inform current and future policy considerations.

Much of the policy has been influenced by point estimates<sup>23</sup> from special surveys or studies relating to either the economics or labour related to those industries. However, in the case of the matchworks industry, my investigations have revealed very few formal researches of relevance- that too in a very limited context. One was an FAO study (Tandon, 1991) on forestry that mapped the industrial landscape; the

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<sup>23</sup> *Point Estimates*- a macroeconomic view, predominantly in labour research, that uses aggregations of different kinds but is not able to include qualitative inputs whilst making broader inferences (Mitra, 2013)



second was more contemporary and was done through a third-party syndicated research (Nielson Report on the Safety Match Industry, 2011-12). The Nielson Report was prepared on behalf of the matchwork industry in Sivakasi primarily to generate data and provide a members' viewpoint through an objective lens to government. Apart from a commercial perspective of the industry, it offers a contemporary view of the landscape of the units. The report is not in the public domain but only available on request to peruse at the Match Manufacturers' Association offices in Sivakasi.<sup>24</sup>

The industry ecosystem includes a range of related businesses, and their market transactions involve raw material supply-chains, semi-processed intermediates like colours and dyes, commodities, and services including skilled, semi-skilled and unskilled labour. As Sujata Patel describes in her assessment of units of petty production in an informal economy, these activities are 'distributed, consumed and reproduced' (Patel, 2016, p.10) in manufactories and their surroundings. These are, she argues, indistinguishable to the standard definitions of work organization through their economic organization. Whilst it is not the focus of this study, I observed an important connection of the organization of these workplaces to the taxation structure of the industry (Appendix VI-Tax Structure, 2012). To take advantage of the tax structures, these workplaces have placed themselves in the shadows of the manual and household categories, as semi-mechanised, away from mechanized or automated processing (Appendix X: A Summary of Match Industry Categories). Easy as it is to argue the economic pros and cons, I restrict myself to the point where skill is affected in such an environment and ask about the implications of these practices for knowledge transfer. I trace back to the points discussed in Section 1.2 and the opportunity created to study isolated knowledge processes.

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<sup>24</sup> All India Chamber of Match Industry is the representative association since 1949 and is headquartered at Rajkote, 110, Kamaraj Road, Sivakasi, Tamil Nadu, India

## 2.7 Conclusions

Consideration of the informal sector, on the one hand, and workplace studies in the historical context of the match industry, on the other pose at this stage, more questions than answers on the how knowledge production in the non-dominant sectors of employment, that includes the matchworks, can influence or benefit from wider policy awareness. In this chapter I have argued that we need to see ideas like the formal and the informal as sitting along a continuum of (labour) organization which demands quite different lenses with which to examine its top-down forces (government and policy) and bottom-up (historical-practice) practices in industries like the matchworks.

I have also pointed to the inherent tensions and contradictions in vocational education and training. These include the intersections of the past with the present, the large with the small, the indigenous craft-workers with the large-scale operators, traditional with the contemporary, and the gender driven with the gender-neutral spaces jostling for academic attention. I have also explored the ways in which the colonial legacies in India allowed for kinetic extensions of old industrial practices, and their corresponding workplace learning methods, until they were disrupted by economic or technological factors. However, the delineation from popular practices elsewhere, like the German apprenticeship system, from the realities of the disjointed employment frameworks, spurred several researchers (Bremner, 2013; Hariss-White, 2004; Patel, 2016) to examine local conditions and practices. In the process they have also drawn to the attention of policymakers the need to disaggregate data so as to make a wider variety of work, workers, skill and workplaces more visible. Seen in this context, I have made a case for sociological and learning approach to studying the match industry as a unique, though not an unrepresentative, site for understanding workplace learning.

## **CHAPTER THREE**

### **Learning Theories and Workplace Learning**

#### **3.1 Introduction**

This chapter brings to the fore the key processes under investigation in this study; learning and learning models, so as to help shed light on workplace learning in the informal economy in India. Whilst Chapter Two covered the informal economy and related literature, this chapter focuses on the conceptions of learning and isolating the path from cognitive theories towards workplace theories. Because of the vastness of material on these topics, this chapter will sketch out some of the main frameworks and debates. It will place particular focus on whether, how, and in what ways, these theories and concepts help us understand how knowledge is acquired in workplaces characterized as non-formal, where workers are often illiterate, and the social relations of the workplace are culturally-mediated by historically-shaped local practices. The question as to how knowledge, expertise and skills are acquired in such settings, so that they are passed from one generation of workers to another, is particularly challenging to understand in the context of a more formal means of valuing learning as outlined in Chapter Two.

I will also be arguing that it is important to take a multi-dimensional view of how learning occurs in the workplace, and that such an approach is important to understand and interpret the knowledge claims made in this space (see Billett, 1996; Illeris, 2000; Elmholt, 2003; Unwin, Felstead & Fuller, 2004; Engestrom, 2006; Werquin, 2010); Fuller & Unwin, 2011; Bathmaker, 2013; Avis, 2014; Chan, 2015; Marton & Taylor, 2016). The authors in this group, even though they explore the different dimensions of workplace learning, tend to converge on the importance of learning in relation to context. Werquin (2010) argues that informal learning happens in daily life with family and friends as well, and is likely to continue through

one's lifetime. The claims made by these researchers regarding non-formal and informal learning range from the extremely complex to the simple and banal in daily-life; a representation that is not far from instances of learning observed at the matchworks in this study. Nevertheless, the reality of the more unstructured environment of the informal learning systems is very different from the structured environments of formal and non-formal learning systems inviting us to pose different theoretical questions.

The first part of the chapter sketches out the main approaches and assumptions of the early learning theories with their focus on individual cognition, as the primary and perhaps only way of learning. I then examine the question of how knowledge is transferred, particularly from experts to new learners, on the one hand, and how automation changes knowledge exchange, on the other. A final section explores how work definitions are being re/configured with changing trends in extended boundaries and shrinking workplaces with automation.

## **3.2 Locating Learning Theories for the Workplace**

The approach and focus of the early learning theories was on individual cognition. As will become clear, these approaches gave ground to other – more social - approaches in the 1970s, with the growing acceptance that learning is stimulated from *within* and from *outside* the individual; and that learning is also both social and relational. A second part of the section deals with this broader contextually oriented and thus more 'social', view that includes the idea of the 'situatedness' of the individual. I will show how these combine an understanding of learning as being shaped by capacities and processes within the self, as well as also being mediated by groups and the wider communities.

### **3.2.1 Cognitive approaches to learning**

Early learning theories relied heavily upon the cognitive and behavioural assumptions about learning so as to understand how (new) learners learn. One of

the earliest theories of cognition and learning was postulated by Jean Piaget (1966), where he emphasized experiential learning. Piaget's studies were based on children at play. In particular he studied cognitive development in children, and how they acquired different abilities over time. This resulted in him postulating a staged-theory of how children build blocks of knowledge or schema (Wadsworth, 2004) via processes of *equilibrium*, *assimilation* and *accommodation*. Assimilation and accommodation use the existing schema or the blocks of knowledge; the former is seen in existing schema dealing with new objects and the latter in situations that require changes to deal with new objects, as well as in new situations. The idea of *equilibration* points to processes that act as enablers for the child to move through the stages, as the learning is adapted to newer situations. Taken together, this movement results in higher and higher forms of learning, and thus cognitive development. This, Piaget claimed, did not happen gradually, but in leaps and starts.

Even though he did not explicitly connect his theory to education, it began to be used widely to build formal education systems, which reflected his staged, developmental understanding of a more or less linear learning path for the child. I start with this basic theory of learning so as to contrast it at a later stage in this study with the less linear, non-formal systems of learning. However the point that Piaget made in the different approaches that children use to learn that is different from adults is highlighted here in the context of adult workers. Cognitive growth, according to Piaget, 'occurs independently of any formal schooling' (Nurrenbern, 2001, p. 1110). What the spaces were outside of the formal systems were not elaborated beyond the space of the family?

### **3.2.1.1 Learning in context**

Whilst Piaget's cognitive theory is useful as a starting point, later theorists were to point to the significance of the settings, or contexts, for learning. These are of particular interest in this study given my focus on knowledge assimilation in the workplace – as distinct from a setting like the home, or the family. Four thematic approaches will be discussed here each interested in how individuals learn.

The emphasis placed on experiences stimulating learning can be traced back to the seminal work of John Dewey (1916; 1938). The definition of experience as “...physical action, the consequences of that action, and the individual’s judgment of the consequences” (Burke et al., 2009, p.18), is possibly one of the earliest models of work-based learning. Even as the basic principle holds good in today’s workplaces, a further question arises as to the role of newer mediators of learning like automation.

Like Dewey, Vygotsky (1978) also placed an emphasis on the relationship between the wider social factors outside the learner, and how this mediates and shapes ongoing internal processes. In other words, Vygotsky is concerned with how we learn to become particular kinds of social beings, as the outside shapes the inside. His conceptualization of a ‘zone of proximal development’ (ZPD) as a stimulant to learning included the surrounding community activity around an individual. In practical terms – and for teachers in education settings - the zone of proximal development means that the student is assisted in their learning by the teacher through engaging the learner in tasks that are slightly beyond what the student can do on her own. Where Piaget underestimated the impact of social factors in learning, Vygotsky’s (1978) work began to point to new directions for research on learning. So whilst cognitive approaches to learning help us understand the motivations of a learner, they are less able to explain wider phenomena situated beyond the individual.

Donald Schon (1983) used the term of ‘reflection in action’ to depict learning through experience and doing. Reflection is a key aspect of learning as highlighted by Schon, that is even today visible in many formal, decontextualized learning models. By decontextualized I mean the detachment of the learning process from an event that it draws its inferences from, a definition that is further refined in Section 3.2.2.

A model of adults’ experiential learning was proposed by David Kolb (1984) where he described four stages which explored the relations between concrete experience, reflective observation, abstract conceptualization, and subsequent active

experimentation. The work of Kolb acknowledged that the individual learning depended upon extraneous factors, even as it underlined a lack of surrogacy for experience. Some years later, an additional dimension of 'context' was added to Kolb's work by Boud and Walker (1991). They explored the notion of experience as a result of the learner's interaction with the 'social, psychological and material environment or milieu (p. 13). In other words, the learning is consequential to the interaction with the environment in which the learner is situated.

To this body of knowledge from what had become known as the constructivist school, Mezirow (1991) introduced the concept of transformative learning, which connected content (*what happened*), to process (*how did it happen*) and premises (*deep rooted beliefs and assumptions*). However, many of the works so far mentioned do not include the detail and potential effects of the context for the learning, prompting criticism from researchers like Jarvis (1987) and Taylor (1998). The criticism extended specifically to Mezirow's work (1991) and his lack of connection to, and elaboration of the ways in which the construction of knowledge emerges out of the specific contexts in which it is situated, and from which new interpretations are made possible.

A series of writers drawing on postmodern theories highlight the relationship between the person, the context and experience. The "...inseparability of action from conditioned beliefs and practices" is highlighted by Usher, Bryant and Johnson (1997, p.183), that generates a more dynamic approach to learning at work. Mezirow (2000) subsequently revised his theories to include context. He suggested a frame of reference that involves 'cognitive, affective, and conative dimensions' that selectively shapes feelings and dispositions (pp. 16). In later years some of the work emphasised experience "...as an expression of the form of learning" (Illeris, 2007, p.186) was built on Kolb's (1975) work. In short, several works of earlier researchers began to also include context in the later years.

### **3.2.1.2 Learning as socially-mediated**

The shifting of focus from cognitive foundations to the social factors was initially based on the work of Vygotsky (1978) and later his student Leontev (1981).

An interpersonal process is transformed into an intrapersonal one. Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). All the higher functions *originate as social relations between human individuals* (Vygotsky, 1978, p. 57).

Vygotsky developed the first principles of a theory called as cultural historical activity theory (CHAT) in the 1920s, that focused on the concept of mediation instead of the learning that focused on the impact of the stimulus on response (Nussbaumer, 2012). The theory emphasizes the tasks carried out in a context. Engestrom (1987) expanded this theory to assert the interrelationships between the individual and the community. He went beyond the stimulus-response (SR) model of Vygotsky, using the element of mediation and cultural artefacts to describe the learning at work (p. 133).

Other researchers who used Vygotsky's work were Collins, Brown and Duguid (1989), who developed a theory of Social Cognition, whose key element was the idea of "cognitive apprenticeship"; a method of coaching learners on tacit skills, so as to bring out the cognitive processes for the apprentice or learner within a deeply contextualized real world. If Vygotsky's ZPD (Zone of Proximal Development) helped a learner develop their knowledge and skills by the teacher engaging the student to do tasks that are a slight distance from where their learning currently is, the cognitive apprenticeship coaching, with the teacher contextualising the learning, would enable the learner to achieve a level of skill beyond what she could have learnt on her own (Burke, et al., 2009, p.20). In other words, the social cognition approach from the teacher enables a level of higher learning for the apprentice than what she could have learnt on her own. More recently the Situated Learning Theory of Lave and Wenger (1991) with its emphasis on *communities of practice*, was also



based on Vygotsky's work, which we discuss in more detail in Section 3.2.2 of this chapter.

### 3.2.2 'Situated' learning theories

The perspective of 'situated' or 'contextualized learning' considers individuals as actors within their own cognitive, affective, social and workplace dimensions, that are in turn enmeshed in those social relations arising from participation in the workplace (Lave and Wenger, 1991; Winch, 1998). The assumption of the earlier cognitive theories was that the actors' relationship with the knowledge-in-activity was static. In other words, the individual is distanced from the surrounding situation and the activity around her, which is certainly not the case. Lave and Wenger emphasized that 'learning is an integral part of the generative social practice in the lived-in world' (p.35). This is a critical juncture, where acknowledgement of the dynamic and real-time interfaces between the individual (Lave, 1991) and the surroundings assists in crossing the epistemological bridge between the older cognitive theories and the newer 'situated' theories. The latter invokes general human activity is a more holistic way, including the situation and the situational variables forming a basis for this study.

Lave differentiates between 'contextualized' and 'de-contextualised' ways of conceiving learning, highlighting the latter as more prevalent in formal academic systems, which may not be able to explain the knowledge production and transmission in a socially constituted world (Lave, 1991, p.202). The two metaphors - of learning by *acquisition* (cognitive theories) and learning by *participation* (Lave and Wenger, 1991) - created a series of debates during the mid-nineties with justifications on how learning is either understood with one metaphor or the other.

Subsequent researchers have moved toward a non-dualist view that learning embraces both metaphors (Anderson et al., 1997; Billett, 2001, p. 432; Engestrom, 2003, p. 116; Illeris, 2003, p.170). Their work has been enhanced by the notion of a particular 'structure' for learning that includes two processes and three dimensions.

The two processes are (i) integration between the learning and the surroundings, and (ii) internal individual processes that inform the interaction with earlier learning. The three dimensions include the 'cognitive, the emotional, and the social-societal dimensions' (Fenwick, 2001). With *participation* now established (see Wenger, 2013: Video), the complementing views of adult-learning theorists and VET researchers have disrupted the normative prescriptions on the learning at work that were largely de-contextual (Elmholdt, 2003; Poortman, Illeris & Nieuwenhuis, 2011; Winch, 2013). By de-contextual, I mean the distancing of learning from the workplace, a conceptualization that VET researchers used to differentiate classroom-based notions of learning from that which was *in situ*. Winch (2010; 2013), interrogated the relationship of learning at work, and the workplace. He differentiated the three components of know-how, as skill, transversal abilities, and the application of the transversal abilities in the workplace social context; he argued that *knowing how* and *knowing that* (p.281) are two different things.

Lave (1988) has also criticized the traditional understanding of the 'transfer of learning' that arose from experiments of both Thorndike (1913) and Judd (1908). Her views went beyond the tools of memory, and when adapted to different situations came to be known as the *practice view*. She argued that people participating in specific practices participate in developing knowledge relevant to those situations. According to Lave (1988) and Lave and Wenger (1991), the currency of knowledge and its relevance is decided by the communities of practice. Her emphasis was on the tools of knowledge that individuals transfer from one situation to another rather than on the similarities they establish between the problems they encounter in different settings (Lave, 1988, p. 44).

Whilst the work of Lave and Wenger (1991) is seminal in introducing communities of practice, there are two limitations of their work as far as this study is concerned. The first is the way the work is organized and consequently the creation of skills, and the second is the configuration of formal and informal learning. Both of these are linked to the literature of craftwork referred to in Section 3.4 of this chapter related to research in India.

If learning for an individual is different from learning in social groups, do apprentices in different situations learn differently? At the same time, does gender matter - meaning do women learn differently to men in the workplace? Recent research from a socio-cultural perspective of work differentiates situated forms of learning which in turn mediate and thus conditions learning and the learning event in part (Wertsch, 1991), from conceptualisations of apprenticeship to the related learning at/for work (Billett: 2001; Illeris: 2003; Fuller and Unwin: 2011). Gilligan (1982) argued that women learn differently than men laying a new pathway for research that Boud (1993) drew upon to explore women workers in the informal sectors of the economy.

### **3.3 Beyond Codified Knowledge: Learning from Others/transferring Expertise**

How does the individual's tacit knowledge originate and get passed on? And, in an epistemic sense, how does it differ from other forms of knowledge and knowledge production?

Tacit knowledge, is intrinsic to the individual - is embedded in her experience, and manifested in a demonstration of skill or application. It has to be taken in by the learner and taught by the owner of the tacit knowledge or experience, and is therefore more difficult to reproduce or transmit. Vocational learning that is situated has a higher degree of tacit knowledge and therefore needs to be sensitive to those elements embedded in its learning as it passes on from one individual to another, and from one related context to another. Even as I start with this simple premise, the thesis uncovers more details on the conditions of how workplace knowledge is produced and transmitted.

Alice Lam extends the idea of tacit knowledge from Polanyi (1967) arguing: "Individuals are the principal agents of learning, but learning is socially embedded" (p. 94). The social embeddedness of learning, or the context-richness of tacit

knowledge (p.490), is also what makes the learner adapt and adjust to her own learning needs. Contrasting explicit knowledge that can be codified with tacit knowledge of the individual, Lam conceptualises the networks of relations that the individual is exposed to as “social containers” of varying boundaries or shapes, that are also characterised as forms of ‘relational embeddedness’ or cohesion (ibid: 95). In other words, the degree or intensity of the relations formed/drawn by the individual define the shape of the network. However, not all researchers have separated explicit knowledge from tacit knowledge as the means of learning. Arguing that knowledge is generated by the active and iterative interactions of explicit and tacit knowledge, Nonaka and Takeuchi (1995) highlight how tacit knowledge of individuals and their practical know-how can be aggregated into intellectual property for the organisation. In other words, individual tacit knowledge can become the source of organisational expertise, a phenomenon that was observed in the match units, and is discussed further in Chapter Seven.

The simple and commonly used connotation of the word knowledge is ‘the theoretical and practical understanding of a subject’ (OED, 2015). I suggest that whilst the accepted usage of the word is not contested in general terms, how and what it means in different contexts can vary based upon situations. Ann-Marie Bathmaker (2013) teases out the conceptualization of “knowledge” in the context of vocational education. She argues that definitions in different contexts have given rise to different typologies. Suggesting ‘tensions in all debates about knowledge in vocational education (p.91), she invokes the contexts related to qualifications, and the contestations of different stakeholders in the vocational spectrum in a bid to identify three categories or “ideal types” of vocational education and training (pp. 90-91). The first is workplace vocational learning (Eraut, 1994) that is specific to practices, followed by work-related education that is more generic, and does not include workplace learning (Young, 2008). The last type is pre-vocational education that is more preparatory in nature aimed at that segment of learners just entering or aspiring to enter the labour market. The conceptualization of knowledge, Bathmaker argues, can be contrasted between the abstract, theoretical and context-independent frame, on one side, and the anecdote-led, everyday, context-laden, on

the other (Bathmaker, 2013). I use this contrast to start with context-dependent learning and explore ways in which one can engage in a process of abstracting from the specific knowledges in daily work, or *modus operandi* to draw broader generalisations or *opus operatum* (Bourdieu, 1990).

Secondly, Bathmaker (2013) points to the tendency of policymakers to refer to ‘skills’ rather than to ‘knowledge’. This is an important issue in my research. At this stage, I find more compelling Bathmaker’s understanding of skills being a subset of knowledge. My questions to policy makers have explored the relationship between knowledge and skills in pre-employment vocational education; this is examined further when I look at the relevance of policy to current practice.

### **3.3.1 Transferring knowledge and skill to the machine**

Braverman (1974) was one of the first scholars to concern himself with the problematic relationship between skills and automation. He pointed to the consequences of automation as leading to the ‘deskilling’ of the worker, as skills were absorbed by technology as well as technology driving the more efficient work patterns of the worker, in a Taylorian sense. In other words, the simplifying of tasks by machines leads to the workers losing their skills in what can best be understood as the degradation of the work done by the skilled worker. Burawoy (1979) drew attention to the capacities of humans and their agency, and the manner in which technology is appropriated and utilized by workers. Whilst workers use technology in ways that mediate their power, they can also adapt to the same technology and influence its operation within the organization.

Automation, as an application of technology, has seldom been placed at the centre of debates on valuing work, and certainly not in terms of a positive framing. Instead there is a zero-sum account in literature (Braverman, 1974). Yet this thesis is interested in exploring whether and how new skills and indeed identities are made possible in the workplace due to automation. Automation can, and does have an

impact on the workplace, and its consequences for workers are important. Those with *transversal* skills within the job are likely to fare better in terms of being able to move around the workplace, rather than those whose knowledge and skills is tightly tied to the one activity. When the nature of material input and output remain the same, but the processes undergo a change, the relevance of existing skills and learning also undergoes a change. A transversal skill is the ability of an individual to learn a skill in one context and perform it in a different context.

Maurice (1986, p.68) uses a variation of this: a skill to perform a task and the ability to adapt it to another, which he refers to as *polyvalence*. This notion can be extended to the ability for a worker to learn and perform different jobs within the same workspace. Any change in the work situation results in a psycho-physical change for the individual involving the workplace, as well as the social conditions (Gramsci, 1971, p.32) such as wages, a change in physical and mental equilibrium, and in time and interactions with others. Automation also brings with it an element of de-skilling (Orr, 1996, p.150; Terkel, 1972, pp.159-63) and dislocates the individual from the existing work-situation. The resultant is similar to what Braverman (1974) argues is a loss of individual value to the labour process. My interview questions evaluate the scale of change due to automation - ranging from a cataclysmic change of work for the individual, to a lesser form; of the machines prescribing human behavior through 'directive documentation' (Latour: 1986, quoted by Orr, 1996, pp.105). The transmission of individual knowledge then takes a more complex form as the man-machine effort is mediated in new ways.

The impact of automation and its consequences on skill development is examined in the work of Orr (1996) on social groups in workplaces being changed as a result of automation. Orr comments on the ability of photocopier mechanics in his study at Xerox who were able to identify and trouble-shoot problems in the machine using a knowledge base and an experience base (1996). He also points to the concept of "failure" as a measure of learning in the workplace (1996, p. 158). His work builds upon Braverman (1965), but also questions the relevance of all of Braverman's claims regarding contemporary work practices. Orr's work, and earlier research by

Egon Bittner (1965, 1983) highlights the social organization around the workplace predominantly deploying ethnographic tools and analyzing from a social anthropological viewpoint. Using the context of machines, Julian Orr says, “perspective is important in diagnosis” (Orr, 1996, p.124). This is applied to ethnographic practice when a perspective of another observer can enrich the interpretation of the object. Interrogating the meaning of ‘work’ Orr highlights the existence of coworkers, and their contribution in the shaping of work: interactions among groups of workers are part of the activities that may be necessary for the work, but which are not encompassed in the normal use of the term (pp.148-49). He concludes that the fact that work is commonly done by a group of workers together is only sometimes acknowledged in the literature, and the usual presence of such a community has not entered the definition of work.

Yet another dimension of automation is considered in Suchman’s framework of the situatedness of man-machine interactions (p. 66). She suggests that the intended effects of automation are conditioned by the degree of automation acceptance at an individual level; and the individual’s reciprocal contribution to the effect of automation. Conceptually, this is at conflict with Braverman’s (1974) idea of the worker being an inert object of hegemonic management control. What will be important in my study is whether, how and in what ways Suchman’s claims hold in relation to the matchworks, which are my sites of study.

There is research related to man-machine interactions in general, but the implications for learning in the workplace, particularly in India, has not been subjected to much study. The gradual mechanization of the match industry has its economic advantages as well as its social implications specifically in how women workers are able to adapt. Madelaine Ackrich (1992) argues that a machine’s reality is reflected in its intersection of three dimensions: the machine itself, its designer’s intentions, and its users’ intentions, within the situation of use. In other words, there is an ecosystem (Bourdieu, 1997; Sahakian & Wilhite, 2014) for the machine and its work environs, which mediate the nature of the social relations. In other words, the introduction of a new machine into a manual process redefines the existing social

relations between the workers, as newer skills overtake and make redundant earlier skills. I refer to the above studies to problematize learning for women workers in a changing technology-driven environment, exploring the valuing of work vis-à-vis the individual's expertise.

### **3.4 Workplace Learning**

So far I have been exploring the factors which influence learning in general and learning encounters with automation. I converge now on the individual's learning, in a social context that is embedded in the workplace. Some of the questions that I attempt to address are : what are the exact contours that define workplace learning; how does space and placed spaces re/define the formal-informal categories of work?

The specific notion of workplace being proposed here is not just restricted to the physical workplace, but also interrogates the social and occupational boundaries including homes. In this context the concepts of tacit knowledge (Polanyi, 1967; Lam, 2014 ), occupational identities (Chan, 2015) and the shift from learning as a preparatory phase for employment are challenged through the newer perspectives of work-based and workplace research. Diversity of the spaces that contribute to the learning, and building of expertise are the characteristics that surround the workplace learner.

Several researchers have covered the nature of the workplace itself in their studies in recent years. The contextual relevance for workplace studies has been given prominence by Rainbird, Munro and Holly (2004) via several other researchers and their engagement with workplace and workplace studies. Rainbird et al. emphasized the employment relationship as being fundamental to the effectiveness of workplace learning (p.38) and how expertise is nurtured when there is an expansive, or supportive workplace (pp. 42-43).

Stephen Billett's early exploration of the socio-cultural with the cognitive (Billett, 1996) has evolved into the development of frameworks for vocational education



(Billett, 2014). His attempts to reconcile knowledge in practice with formal vocational frameworks (Billett, 2001) using the individuals' conceptualization of 'domain' that they bring to workpractices or workplaces (p. 434) is based on their socially constructed ontogenies. Academic disciplines and their boundaries that define workplaces and workers (apprentices) have also been explored by Michael Young (2005) in a bid to establish a working model for formal-informal credentialisation of vocational expertise. He questioned the employer-driven motivations to create 'flexible' learning, that was largely informal but offered wider scope for the learners to be trained on employer-defined expertise (p.190).

Avis (2014) draws an important distinction between work-based learning (WBL) and workplace learning (WPL); WBL is WPL that is acknowledged and credentialised (p. 46). At this stage, however, I start with the basic differentiation set out between Work-based Learning (WBL) and Work Place Learning (WPL) through two key differentiators that sets WBL apart: a) that the emphasis is on *learning* rather than the placement of 'work tasks' (Burke, et, al., 2009, p.17); and b) that it is 'based' on work but does not have to take place *at work* (Brennan and Little, 1996). This research is primarily focused on WPL (Avis, 2012); that is, learning without credentialisation and which is deeply contextualized in the workplace and its environs.

Knowles (1984) identified elements of adult learning that are relevant in the both formal and informal workplaces. On the same lines, Jarvis (1987) contended that, the adult learning process in workplace studies is not disconnected from the social context (pp. 11-12). Rather, it is important to emphasize that it is deeply embedded in the world in which the learner lives. This can also be interpreted as a situation where observation, objectification of the culture through socialization, and internalization by reflection and experience come together to create a metaphoric 'nursery' for the individual (Mead, 1967, p.1; Bernstein, 1971; Lawton, 1973). Into this nursery metaphor for the individual, a transformation is enabled from *meaning schemes* into *meaning perspectives* (Mezirow, 1991). Jarvis adds that the *functionalism with the individual* (p. 14) is not just a receptive process but one when

the learner absorbs, modifies, and further transmits, their social experiences through their own perceptions and interpretations.

More recently Michael Eraut has addressed elements of non-formal learning and implicit knowledge embedded in practice. He suggests a typology of non-formal learning involving *past episodes* of learning that are embedded into *current experiences* and recalled into *future behavior* (Eraut, 2000). He builds on the work of Horwath *et al* (1996) on what are called episodic and semantic memory paths of reconstruction. This is again an expansion of Kolb's (1984) explanation of experiential learning, when an individual learns from experience and stores that information in memory to recall at an appropriate time (Eraut, 2000, p.117).

Knud Illeris (2004, 2007) introduced the concept of learning spaces, emphasizing the essential nature of learning as being situated. Each learning space is a different learning situation and leads to a corresponding set of learning outcomes and situations. In this conceptualization he differentiates workplace learning from school and educational learning, as well as the more recent trend of net-based learning. In his more recent works, he argues that workplace learning is an integral part of the individual's working life, in a broader perspective can be restricted by the immediate production or service in which the worker is engaged in. In that sense, the learning is distanced from the theoretical understandings, becomes subject to the 'power relations and financial interests' relating to the production itself (Illeris, 2009, p. 140).

In recent years, informal learning as a line of inquiry was pursued by several researchers (Rogers, 2014), while exploring learning from occupations that were not formal in nature and depended on observation and experience. Erkin and Soygenis (2014) used the learning of architects in the field to conceptualize the vocational expertise from that profession. Unluhisarcikli (2007) traced informal learning in the craftspersons of Turkey, whose expertise was drawn into formal apprenticeship programmes. She traced the apprentice practices of the *ahi* guilds and the norms that nurtured the journey of an assistant apprentice to master. The journey also

involved mastery of 740 social rules to be learnt. Some of these traditional insights have been built into Turkey's budding apprentice programme.

Allais, Raffe and Young (2009) attempted the first of the many efforts towards differentiating the non-formal from the informal work, in their research on building qualification frameworks for nation states under the auspices of the ILO (2009). They build an argument for redirecting vocational efforts at a policy level from qualification-based frameworks to outcome-based frameworks (pp. 6-8) incorporating workplace-based realities (p.8).

Burke, et al., (2009) used their own studies in evaluating Foundation Degree (FD) programmes in the UK and their extent of deploying work-based learning for their curricula. For this, they used past work by researchers to make recommendations on a pedagogy of work on work-based learning. Boud and Garrick (1999) urged a shift away from the perception that educational institutions as the only places of learning towards the workplaces as 'sites of learning' (p. 3). The conventional thinking for learning related to work was in its preparation or training for work; to get the individual a set of skills as a readiness for employment; Boud and Garrick, argued that learning was much more than a preparation for employment, a 'lifeblood that sustains' (p.1) coming from almost all places that are connected with work. In other words, learning is proposed as a product of everyday thinking and actions; the idea is then used to considering how workplaces structure activities and guidance for learners, that happens continuously. Workplaces have the ability to provide direct and indirect guidance to the learners that may be different from other formal learning alternatives.

Selena Chan (2016) examined processes of replicating work through observation by the apprentice as a key process for informal or non-formal education and training. Chan conducted two studies with 27 participants to conclude the process of *mimesis*, or the learning by observation, imitation and practice (p.2), was an essential aspect of learning in the workplace. She argues that tacit learning (Polanyi, 1967) is deeply contextualized, complex and individual; it does not take place in linear stages.

Expertise develops with the learners as they observe and replicate tacit knowledge and the ability to internalize the reflective and emotive aspects of the 'expert'. These aspects she calls as *occupational identity markers* (Chan, 2015, p.4) that identify the practitioner with a particular skill or craft, and a degree of expertise. At the same time the learner cannot fully understand the tacit knowledge of the expert without understanding the social context (Lam, 2014, p. 94).

Much of the research cited so far has been done in a context that is far from the Indian workplace. Isa Boud is an exception, and her work with de Bruijne (1993) covered women workers in garment industry in a comparative study of India and Mexico. However, there is more recent work done on crafts persons in Indian villages (Ranganathan, 2017; Basole, 2014). Ranganathan (2017) conducted and reported on ethnographic studies that look at the significance of skills, and the premium placed on the handiwork of artisans in a south Indian village called Chennapatna. Basole (2014) studied traditional knowledge and innovations in practice by expert weavers of Benares sarees. Parthasarathy (1999) explored the changing market conditions of artisans, like potters, spinners and basket weavers, in an attempt to ascertain flexible or permanent livelihood options, and the linkages to non-formal ways of learning the trade. Haynes (2012) did archival research of the historical changes in the textile industry and conducted interviews with workers in the handloom and power-loom industries to study the elements of 'small town capitalism'. Patel (2016) explored the epistemic foundations of urban studies, placing the informal work segments and the 'petty systems of production' (Hariss-White, 2003) in the limelight: a conceptualization that helps in my examination of the changing nature of work and learning at the matchworks. She challenges the political economy definitions in small ecosystems of production where geographic boundaries and peripheries are blurred by flexibility of capital and labour casualization (p.10) The last referred work contributed to my own study through developing an economic-social understanding of the petty production which defines a small but nevertheless significant part of the overall match industry ecosystem. From the others, the insights were primarily on the approach to the field and the research methods used. In some sense, they reflected my concerns of workplace

learning intersections with the informal economy of India.

A notable point that emerges in this study is the study of women. Existing studies in the informal sector conducted in India (Bremar, 2013) and the research on women's learning are contrasted to an extent from what this study has revealed for women workers. Women workers in India have attracted earlier research into working conditions, wage differentials or career pathways (Bourdieu, 1974; Isa Boud, 1993; Nagammal, 2005; Froerer, 2012). Most studies express an implicit or explicit concern for the disadvantageous position for women, including their minority representation in the workforce. This norm, also prevalent in the informal sector in India, found interesting contrasts with the women in the match industry. A majority of the workers in the industry are women: according to Chockalingam, one of my primary respondents and a gatekeeper to the field, "90% of the workers in the match industry constitute women, and this is a trend that has continued since the 1950s" (Interview, 2015). So, would the learning theories for women or the research findings that discriminate employment opportunities for women elsewhere, apply in the match Industry? I keep these questions in focus as the research progressed.

### **3.5 A Skill Model for the Workplace?**

Skill can be a property of agents or a technique (Winch, 2013, p.285). By agent property, I mean the ability of a person to be able to exercise a particular attribute. This might also include a technique. The technique itself is a way in which the individual demonstrates his/her know-how. However, the 'honorific' of skill highlights a different dimension when we refer to 'male' jobs and 'female' jobs, that is, those jobs that are stereotyped as a particular gendered job. In my pilot studies I looked for exceptions to this and recorded such events during the main research as well.

Could there be two different workplace situations that affect skill definitions- one in a smaller manufactory (cottage sector) and the other in a larger unit (fully

automated or semi-mechanized)<sup>25</sup>? How can we use a single model to differentiate the phases of skill development?

Of the several conceptual tools discussed in this chapter and used in this research, the skill model of Dreyfus and Dreyfus (1986) needs a special mention. Hubert Dreyfus and Stuart Dreyfus pursued learning consequences in professions that result in 'acquired expertise' in areas as varied as nursing, in sports like chess, and day-to-day tasks like driving a car. They used these to build a model of skills in the professions. Their model attempts to trace the attributes and contextual dependencies of five phases, as a novice learner becomes an expert (Dreyfus and Dreyfus, 1986, pp.16-51; Dreyfus, 2004). According to Dreyfus and Dreyfus, the learner in the first stage is exposed to generic rules but is not allowed to process any information through these rules. They note that this learning is largely context free. The initial rules and the processes of familiarisation are set aside or jettisoned as soon as the learner gains some experience, who then moves to the next stage; of being an *advanced beginner*. It is here that the context begins to draw closer to shaping the individual's learning and gets increasingly situational as the learner begins to absorb the "sights and sounds" of that context. The third stage of skill acquisition, also referred to as a *competence* phase, is based on a logical, almost hierarchical, procedure of decision-making or competences to choose a set of definitive actions from a vast array of alternatives or information. There are elements of simplification, even as the situational complications for the learner begin to increase. The learner begins to exhibit some intuition here (Dreyfus and Dreyfus, 1986, p. 25), and is in a position to feel responsible for the outcomes arising from her actions.

While the first two stages characterize "detachment" from the outcomes, this stage calls for the learner's "involvement", and is equated with what cognitive scientists refer to as "problem solving". The fourth stage is one of *proficiency*, or "know-how"; a condition that the learner acquires from accumulating experiences of self as well

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<sup>25</sup> Please see definitions of Manual, Semi-mechanised and Fully Mechanised in Appendix -X The Matchworks process

as from others, converting it into a state of “intuition”. In this stage the proficient performer combines her/his experience of the intuitive organisation of tasks, and indeed is in a position to manipulate the immediate environment even as s/he analytically applies the subdued but existing rules towards possible outcomes. The final stage is one of *expertise* and reflects the competence that has been discussed in the third stage of this model, combined *with* the maturity to process situational demands.

Some of the experts’ comments may sound prescriptive, or be hard to legitimise (Dreyfus and Dreyfus, 1986, p.34), but that is precisely what the outcome demonstrates; the predictability of their statements before an occurrence bestows power on and recognition of the expert. In other words, the ability to “predict” outcomes is what makes the *expert* stand out to/from his *beginners* or apprentices. Whilst this model offers an initial foundation of predicating skill development via knowledge acquisition for the worker/apprentice, it does not offer adequate explanations to situations that are dynamic to their socio-cultural influences and automation. This is the point of departure as I proceed with the study.

### **3.6 Extended Discontinuities in the Formal/Non-Formal Workspaces**

In Chapter Two (Section 2.5.4, Table 2.1) I proposed a framework that represented the discontinuities arising from a formal viewpoint of the workplaces and the gaps with practice that is largely informal. With the literature on learning theories and those emerging around workplaces, the framework can now be extended to highlight the research gaps. This is represented in Table 3.1.

	FORMAL FRAMEWORKS	INFORMAL/NON-FORMAL INTERPRETATIONS or REPRESENTATIONS	POTENTIAL RESEARCH GAPS
<b>Skill and Expertise</b>	Definitions-led	Performance-led  Recognition of Prior Learning (RPL) <sup>26</sup>  Usage disconnected from macro-definitions	Differences and expansions of definitions in the non-formal spaces
<b>Methods of Measuring Expertise</b>	Standardised methods, formal and decontextualized  Quantitative	Localised, Socially-generated  Qualitative	Complementing approaches, potential synergies between available methods and newer workplace methods
<b>Approaches to understand Workplaces</b>	Learning Models of cognition; decontextualized and possibly Work-based	Situated, contextualized: workplace-based	
<b>Recognition</b>	Certification, Examination and Credentialisation	Performative, workplace-social hierarchies	
<b>Policy Decisions</b>	Predominantly on large scale aggregated numbers	Invisible to policy considerations- dependent on qualitative approaches	Explore how policy-practice overlaps can be strengthened

Table 3.1: Framework highlighting gaps emerging from the Formal-Non Formal continuum

This framework is used to access the methodological choices and methods in addressing the research questions.

### 3.7 Conclusions

This chapter set out to explore relevant theories of learning that might be deployed in this study, to study learning in the informal economy. The review of the literature reveals the contextual variations of workplace, and the nuances of informal economy that is particular to the Indian context. Also, this study has traced the socio-historical thread of conventional learning theories that were largely cognition-centric to later models that included situatedness, context and communities of

<sup>26</sup> Recognition of Prior Learning: as already explained in Section 2.5.4



practice. Newer perspectives, and indeed distinctions between approaches, findings, contexts, and historical mileux on the one hand, and differentiators of gender, age and literacy on the other are used to signpost the journey of this study towards workplace learning and examining the causality of knowledge production in the workplace.

In Chapter One I visualized knowledge production as the “stone in the middle of the pond” from which the ripples of vocational policy, nuances of the informal economy in India, workplace studies and constructs of learning models, flow out and in. The literature review follows this path, as a metaphor to a) understand the learning theories and b) to go beyond to the situated learning approaches that represent the vocational space. At the same time my endeavor is not to find the ‘gaps’ in the research; rather, to find the areas that are *underexplored* in the recent trends that define work-based and workplace learning. In other words, like the skier testing a cover of snow to sense what is underneath, I test the uniformity of snow of workplace learning for nuances of social factors, namely women’s learning, automation and community-based learning in the informally organized spaces as a sub-sector of the formal sector; and indeed in the formally organized sub-sectors of the informal sector. In other words, this is not only a gap that is being addressed through this study but an identification, or revealing of areas that are emerging within a larger contextual (on automation) and in dimensions that are contradicting the commonly accepted trends (women’s learning) in the informal sector. As an example, we don’t see the insights of practice-researchers like Orr (1996), Sennett (1998) or Crawford (2009) quoted in Billett (2005, 2014) or Illeris (2009) or the other theorists. I found that there is a link that was missing here, with work and empirical evidence from real situations that are not as actively discussed in workplace learning. Hence the effort to tie in the common themes from such parallel literature. At the same time, the methodological choices adopted in the studies by Orr (1996) were useful in structuring this study, and are discussed in Chapter Four. In other words, the chapter traces the fault lines of learning theories as applicable to the four dimensions of informal economy, low formal literacy, automation and gendered socio-cultural influences. As such, these fault lines reappear as the opportunities to

pursue newer, and contemporary insights from the existing, and emerging workplace practices. The chapter also illuminates the possible frictions that pervade the vocational space in the form of multitude of theories, and their manifestations in policy that is proposed through a framework of the formal to non-formal continuum of workplaces.

## **CHAPTER FOUR**

### **Approach, Methodology and Methods**

#### **4.1 Introduction**

In Chapter Two, the literature review revealed work as a contested notion, and the workplace itself as a contested space. This was followed as body of literature in Chapter Three which explored a core concept that is central to this thesis; that of knowledge, its transmission and re/production within the workplace. What was apparent here is that what happens in any one space is not reducible to what can be observed in a physical or absolute sense, but that spaces and practices – or lived space - to use Lefevre's (1974) terminology is produced out of the less visible structures and causal mechanisms within and outside of the workplace. These insights will be central to how I approach work, workers and workplaces which are the sites and object of my study of the matchworks in India.

I will begin this chapter by laying out the philosophical underpinnings of the study and detail the approach towards the research questions. I argue that the multiple levels of meanings and interpretations that manifest in workplace knowledges calls for different approaches to observe, generate, and analyze, such observations so as to arrive at a set of insights and broader conclusions. A case for critical realism is made for this purpose, as well as Burawoy's (1998) Extended Case Method (ECM). The ECM is particularly useful as a methodology in order to connect workplace practices with wider structuring dynamics, including national policy priorities. In short, the chapter addresses the 'how' of the thesis and offers a pathway to realizing the insights promoted by the research questions via the choices.

The chapter builds on the meanings of work and work related knowledges that relate to vocational education as contested spaces of ‘politics’ (see Robertson and Dale, 2015). Robertson and Dale (2015, p.157) ask a question that is of relevance here: whose knowledge counts and is counted, and how it is governed? As outlined in Chapter One, examining the nature of inequalities are fundamental to this thesis. Workplace knowledges are not just a matter of looking at the politics of policy but also the nature of their meanings as they are brokered in different workplace contexts and “lived” through the daily lives of the apprentices and workers. Seen through a Cultural, Political Economy (CPE) lens which Robertson and Dale (2015) develop, it can be argued that knowledges which are embedded in routines of livelihood require observations and methods that examine the various dimensions of making social worlds – through the CULTURAL as meaning making, the POLITICAL as social relations mediated by power, and the ECONOMIC which draws attention to forms of exchange (Robertson & Dale, 2015). In the context of vocational education and its policy frameworks and trajectories in India (GOI, 2015), there are implications for what it signifies for the individual: as an apprentice or expert in multiple intersections of technology; policy indifference; and political conceptions of skill development that tend toward a particular way of framing (a monologic) in turn making other possibilities invisible (discussed as a context for the research questions in Chapter One). As an example, the unique knowledges of a workplace can equip an apprentice with expertise that the external world sees as set of skills and even attaches an economic value to it. In other words, there is a latent knowledge that is *embodied, or physically realised* (Popper, 1978, p.145) as work expertise. These practices cannot be assessed without placing the individual into the workplace, and then at the centre of my investigation into the topic. It follows that an ethnographic approach is particularly useful as means of operationalizing the extended case so as to explore in a fuller and richer way the meanings, relations, and power dynamics involved in the valuing of work place learning.

The matchworking spaces are – it will be argued - what Sayer calls “open systems”, where “...the events are not pre-determined before they happen but depend on contingent conditions” (p. 15). The constituent causal variables may well and do

vary from one situation to another, and from one context to the other. The story of learning for one matchworker can therefore be different to that of another, even if they are in the same workplace. Yet there are patterns that are visible and the purpose here is to establish the underlying structurally shaped causal mechanisms. To gather rich and sensorial data on work practices in the making of match production I have depended on capturing visual images so as to undertake the process of ‘unraveling the unremarkable’ (Tolmie, 2011) but nevertheless remarkable practices that make up daily-life. In the final section I reflect on the ethical and conceptual challenges in studying one’s own society.

## **4.2 Initiating the Field Research**

According to William Filstead, the choice of research methodology and methods is more than a choice of research strategies or data collection procedures. It emerges from ontological preferences and epistemological decisions as to which frameworks reveal “the nature of knowing, social reality and procedures for comprehending phenomenon (Filstead 1979, p.45). Quantitative and qualitative lines of enquiry are often presented as a dichotomy which is unhelpful in that the former is seen as treating people as objects in research whilst the latter tends to focus on the socially-constructed nature of knowledge and meanings attributed to social action with an interest in how to ‘give voice’ to the participants (Bauer, Gaskell & Allum, 2000). In an epistemic sense, I lean towards hearing the subject and how they make sense of their worlds, pre-eminently their world of work as a worker in the matchmaking enterprises, as opposed to focusing on larger patterns of which an individual is simply a number.

As my research questions emerged, my first step was to have preliminary discussions with the policy makers in India. This I did by getting in touch with the National Skill Development Corporation (NSDC)<sup>27</sup> in July 2015 so as to get their perspective on the

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<sup>27</sup> The Background Note to the NSDC and some contextual information for the study is in Appendix IX

skill landscape. This coincided with the National Skill Policy (GOI, 2015) that was launched on July 15, 2015. Access was fairly straightforward following emailing requests for meetings with key personnel, including the Chief Executive Officer of the NSDC. I visited them in late June, and followed up with several personal visits. Between June and September of 2015, I sought to persuade a section of the policy making machinery (NSDC) to consider qualitative methods as a supplement to research in their projects on studying skills (Appendix XIII – NSDC Proposal). In the meetings with their Chief Executive (Respondent IR1; 25 June 2015), and subsequently with the then Head of Monitoring (Respondent IR 2), I discussed conducting selected field studies using ethnographic and visual methods to capture skill development and knowledge production at the workplace. Whilst they agreed with deploying a detailed case study, their view was that any ‘sample’ that is restricted to just one location or industry would not be convincing to their ‘stakeholder groups’ (4<sup>th</sup> September 2015). This reflects the “meandering and often fractuous relationship between research, practice and policy” (Sallee & Flood, 2012, p. 138). My intention was to base my ethnographic case study in the micro-environs of the workplace, and then to problematize the issues arising from their learning at work, and thus the implications for skill development. This, in my view, would offer perspectives on policies in practice and not be limited by a supply-side understanding of policy that the NSDC was (then) tasked to undertake. For the functionaries of NSDC, as policy implementers, the argument that qualitative inputs would supplement macro-level aggregated accounts was convincing enough but it not enough to justify the cost of putting a researcher into the field. Changes in personnel and altered political circumstances in the end dictated this as an unfeasible entry point into the field.

This process raised two questions around policymaking in relation to workplace learning and skills in India which I will return to in the final thematic chapter of this thesis: a) how might learning in practice shape policy (Denzin & Lincoln, 2005); and b) does the question of rigour associated with qualitative approaches (Guba & Lincoln, 1981) lead to a perception of less reliability and poor validity (Morse et al., 2002)? What might be a set of recommendations to policymakers to faces in to the

research site, draws relevant policy conclusions, then faces upward to policymakers without losing the ‘fatness’ of the workers experiences, their workplaces, and the complexity of a specific industry.

One of the objectives of locating the study in India, yet exploring its connections to vocational practice elsewhere, was to enable me to evaluate the efficacy of qualitative methods in the context of the India’s labour economy, and indeed to look at work done using qualitative methods with practitioners in the policy space in India. As a result I engaged with sociological work that used predominantly qualitative methods (Prasad-Aleyamma, 2017) to address policy issues in an Indian context. I also had the privilege of discussions and advice from qualitative practitioners who had worked on projects in India (Srivastava, 2017; Unluhisarsikli, 2015).

As signalled earlier, another set of developments at NSDC disrupted the ring-side view of policy-making in the sphere of skills and workplace learning in India. The CEO and COO of this public-private partnership stepped down on the same day. This was followed by several other exits, including the Head of Monitoring who was evaluating my proposals on behalf of the CEO<sup>28</sup>. The entire process of engagement with the key policymaking and implementation agency of the Government of India had to begin again. In concluding chapter, I explore the notion of continuity and change as elements of policy that are primarily an outcome of these changes and my encounter with the policy machinery. While this is not a direct outcome of my study, these experiences have nevertheless led to questions that shaped both this research and the agenda for future research.

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<sup>28</sup> <http://www.livemint.com/Industry/kzt3Uq7YnqtsaBhsWWi1FK/NSDC-staring-at-HR-crisis-as-chiefs-exit.html>

### **4.3 Which Theoretical and Methodological Approach to Examining 'Routine' Workplace Learning?**

In this section, I describe my overall paradigmatic approach that in turn has shaped decisions about which theories and which methods to choose to help open up the research questions.

#### **4.3.1 General remarks on paradigms**

Paradigms can be broadly conceptualized as positivist, interpretive, and critical theory (Sarantakos, 1998; Srivastava, 2005). A post-modern perspective came to be more visible in the last three decades, which included contemporary approaches like feminism. For positivists, the reality is 'out there' and can be made visible or measured through the application of scientific rules rather than an approach of conjecture. This way of seeing is associated with Auguste Comte (Crotty, 1998, pp. 20-22); it argues for the examination and analysis of the social life with the same approaches that are used for the natural world. An interpretive, or hermeneutic approach, takes the view that reality is in the minds of the people, internally experienced, influenced by circumstances, and continuously constructed as the people interact with others. In other words, when a researcher adopts an interpretive approach, she attempts to understand from the people the meanings *they* subscribe to their social world; or in the case of a writer and reader, as the reader would bring in or infuses his or her personal purpose into the reading (Crotty, 1998, pp. 105).

#### **4.3.2 A Critical Theory/Critical Realist Approach**

The approach for this study broadly draws upon critical theory as a metatheory. Critical theory starts with a presupposition of inequality amongst the actors and sees reality as enmeshed with tensions and conflicts. It argues that social structures are



created through an imbalance of power, through ideologies, access to capital, norms and even social preferences or sanctions. The last is characteristic of a working space and has subtly, as well as explicitly, influenced the world of work. Researchers from the critical theory tradition not only look to expose the structures of inequality (Avis, 2004, pp.212), but also suggest and put into action, strategies which result in a more equitable social order. In the context of the emerging vocational education in England, which I argue is as much applicable to vocational frameworks elsewhere, Avis cautions against not including the interests and concerns of young people who have been marginalised by the education system or not relating to their perspectives while identifying the causes with the politics of recognition within the vocational education.

Critical Realism (CR) can be located within this broad ontological approach – but is quite specific about the nature of this ontology and what this means for how we might come to know and explain the world. Critical Realism is particularly useful in that it points to the need to go beyond the observed and observable. However, reality is not restricted to empirical observations as there causal structural mechanisms that can be activated under particular conditions (Sayer, 2000,p.12). Sayer adds that these mechanisms can be referenced to the observable phenomenon, but they do not account for latent causal mechanisms that have potentials but are not activated. The mechanisms include the powers of both the individual social actors as well as those of the social structures (Elder-Vass, 2012).

Critical Realism emerged from the work of Roy Bhaskar (1975) and was disseminated, through the work of Sayer (1992), Danermark (2002), Archer (1995), and Elder Vaas (2010), amongst others. It positioned itself as an alternate to both positivism and constructivism (Denzin and Lincoln, 2011). Its primary claim is to differentiate the nature of reality to *our* knowledge of reality (Fletcher, 2017). Bhaskar challenged the problematic reduction of ontology to epistemology, underlining the limitations of our understanding through human knowledge in the larger context of reality. In other words, we cannot explain all the realities around us by limiting the interpretations to what we know. There is an acknowledgement that

reality is beyond what we know or see. The starting point of critical realism for Bhaskar was theory and the interdependence of theory to empirical research. By not pursuing the world as theory-laden, but theory determined' (ibid: 182), critical realists can identify causal mechanisms influencing social events or phenomenon. Put simply, critical realists argue that the social world can be understood as having a stratified social ontology – where experiences are the outcomes of underlying mechanisms that have causal properties. It differentiates between the three levels - *empirical*, *real* and *actual*. Critical realists do not subscribe to a view that social worlds are socially closed. Rather, social systems are open systems in that there is no self-reproducing closure – even if it is possible to see regularities emerge (Sayer, 2000). For example, if we take workplace learning from the point of view of the apprentices and the experts, they reproduce knowledges from the past, and the institutional arrangements structure what is possible to say, think and do. However, new knowledges, practices and patterns can emerge that rupture old dependencies, and even the learning paths.

In the workplace the empirical understanding or intelligibility of an event (in this case a learning event) is different from the causal factors of that event. In a vocational context, as we attempt to decipher the process of learning, the situatedness of the learning becomes significant. As Billett (1996, p.4) says, the outcome of expertise is dependent on the social circumstances that provide insight to problems, the possible solutions, and the means to address the problems. In other words, isolating the learning event as a cognitive effort by the individual, or the individual and the tutor from the social surrounding of the event, would ignore the key influences of the learning event on its intended outcomes. Through their actions, individual actors are the elements that sustain a workplace's structure by means of group identities, and the norms that are repeatedly reinforced, over space and time, and through social acceptance. This is despite the same social/workplace structures sometimes restraining individual actions to break free from these structuring dynamics. In this context I will examine the structural elements that constitute the learning environment and those elements that are also constrained by the structures.

Michael Eraut contends that transfer of learning, as observed during the event, is not an event at all but a process (Eraut, 1997, pp.554-555). My research questions address the process of learning by unravelling the 'moment of learning' and its causal factors and structures. As the study progressed, it became important to consider multiple methods, almost in a tiered manner. The gap in explaining the rationale was seen as an opportunity to explain the methods chosen for the main research in this thesis. I relied on multi-method qualitative approaches (Denzin & Lincoln, 2011) so as to strengthen the subjective or anecdotal information arising from any one source. This took the form of a two-tiered approach: a) a first tier – an ethnographic approach which involved doing physical observations along with supplementary visual methods provided a holistic situated view of the entire study area; b) a second tier which dispersing the data collection across multiple sub-sites in the research locations, addressed the mitigation of data risk concentration to a single physical location. Whilst most ethnographic studies tend to settle on an in-depth study of a single location, I relied on access to multiple locations to collect a representative picture of the workplace in the match industry. The aggregate data and responses allowed me to *compare and contrast the* data in detail, whilst at the same time being able to differentiate patterns across the sub-sites. A second data set, in addition to the ethnographic data came from interviewing the participants.

*The concept of* emergence is a concept in the tradition of critical realism which explains the properties of an entity, which is not the sum of its parts. In other words, if there are two components that come together to form an entity, they have individual characteristics, and which do not aggregate to form a combined effect from the resultant entity (Bhaskar, 1978). Emergent powers are properties of the whole entity and cannot be reduced to their constituent parts. Bhaskar's theory of emergence, since refined by others (Elder-Vaas, 2010), helps uncover the types of structural relations that have causal powers. According to Bhaskar, all social structures possess causal powers and liabilities. In other words, there are conditions in the social structure that can enable or restrict objects in acting in certain ways. For knowledge production in the workplace this interpretation means there are inherent

potentialities in the surrounding structures which enhance or inhibit knowledge being produced and transferred and how learning is propagated through the system. The structure's causal powers may, however, not be visible at an empirical level, and require an appropriate methodology and methods to unravel the stratified ontology of the structures.

Any analysis using critical realism is likely to adopt a set of standard steps: *abduction*, or the process of theoretical re-description; and *retroduction*, that is, making inferences beyond the contingent circumstances (Danermark et al., 2002, p.96). By this, one is able to ask questions about outcomes, or effects, which are the empirical observations, and make inferences *beyond* the current observation into *similar* conditions though different circumstances. Abduction is deployed to recontextualise the matchmaking observations into a broader vocational pursuit, whilst retroduction, enables analyses of the workplace situation in making knowledge claims of how other workplaces might be influenced by similar social events or structures.

The methods for identifying and uncovering social structures are different from those that are used in empirical research (Elder-Vass, 2010, p.65). At the same time critical realists, such as Elder-Vass, caution us regarding the incompleteness of the model. He recommends using complementing methodologies in any study of the social world (ibid). This last statement guided my choice of semi-structured interview led interactions with the workers, as well as an ethnographic approach to observe multiple sites marked by differences amongst the occupational community, and involving multiple visits over several months.

The visual images of the workplace enabled study from a distance and provided a greater amount of detail to be reviewed than simply the text. When I studied the observations, and in some instances went back for a further interaction with the workers, this helped strengthen processes of *abduction* and *retroduction*. This is brought out using the stories of participants in the Chapters Six and Seven, and for making knowledge claims in Chapter Eight.

For those who believe critical realism offers at best an abstract method when compared to empirical research, Elder-Vaas (2010, p.65) proposes an opposite view, asking the researchers to accept this limitation. Appropriate methods, according to him, mitigate the ambiguity between the theory of emergence, and deciphering the influences of structure and agency. For my study, this pointer was useful as the descriptions of work from the perspective of the participant allowed me to see how 'work' is perceived and given value by the individual in the workplace.

#### **4.3.3 The Ecosystem: Occupational Community of the Matchworks**

The term 'occupational community' has been described by Lave and Wenger (1991), and later by Orr (1996: 76), to denote a physical group that engages in situated learning in what they call 'a community of practice'. We can extend this definition to a broader identity for the group of people - physically dispersed, though not necessarily homogeneous and culturally distant, in the conventional sense. The "connectedness" is a social construct, just as space is socially-constructed (Gupta and Fergusson, 1992: 11). In this study, I avoid the approach of culture as a space that is not isomorphic to language (ibid, 7-8) or (traditional) community of the region, though I look at their influences on knowledge production. In other words, the community occupies a relational space of vocational interest, work interdependency, and a collective outcome, that furthers individual interests. In this study I refer to this as an *ecosystem*. The idea of ecosystem offers a better visualization of the matchworks, of an agglomeration or ensemble of work practices, communities, community-based norms and business dependencies that work within and between the blurred boundaries of employment, livelihoods and learning opportunities. Here new entrants mingle with those who are experienced in their journey of potentially becoming old-timers, and perhaps experts. The term ecosystem is used to encompass a set of supportive elements for the worker to be successful at work. It includes - in addition to tools – resources, such people and access to other experts, and is an extended visualization of the occupational

community. This is different from and complements the workplace environment that is to a large extent organic. It has elements of expertise from others as well as experiential learning useful to the worker's encounters in and beyond the physical workplace.

During the pilot study, I sensed networks that were there in subtle, if not almost invisible, forms that connected actors in a multitude of roles, yet collectively pursuing a purpose. Individuals moved from one role to another (the worker in the factory to the housewife at home, to the part-time worker in the evening), or held these roles simultaneously. These networks were not dissimilar to the *rhizome* (Deleuze & Guattari, 1987) or the living, dynamic, ever expanding, networks of *mycorrhizae* (Engestrom, 2006, p.1787) understood as a 'horizontal multidirectional' engagement of human lives as against a vertical organizational hierarchy characterized by two key terms: *principles of connection*, and *heterogeneity* (Deleuze & Guattari, 1987, p.7). The result is an assemblage; a coming together of sorts. Mycorrhizae are, in nature, fungal roots, where the changing shapes of the fungus, with its large surface area, absorbs water from just beneath the surface of the soil, working in symbiotic tandem with the plant roots to provide nourishment. By themselves neither can survive for long as the fungus is not a living organism. Mycorrhizae-like networks for organizational researchers represent an emerging organizational structure evolving in an ever-expanding network, *without eliminating the visible, erect, bounded and institutionalized activity systems* (Engestrom, 2006, p.1788). In Chapters Six and Seven I explore the dynamics of such networks and their role in how know is distributed and deployed in the matchworks. The implications for vocational education lie in how individuals negotiate such networks, and if there is a pedagogic option for accessing the inter-psychological processes linking individuals to the social practices (Billett, 2001, p.433).

#### **4.4 ECM as a Methodology**

The use of the Extended Case Method (Burawoy, 1998) in this study is more than a

method of study, as Burawoy initially described it as. Burawoy positioned the extended case in two ways: a) as a 'positive' approach in which the researcher is distanced from the object of the study, "suspending participation in the world" that is being studied (p.5); and, b) a "reflexive" approach that uses theory to examine the world, and which engages at multiple levels with the world around the researcher.

Positive science works with the premise that the external world is independent of the researcher, and the distancing of the researcher is to avoid any interference or distortion in the natural order around the world (during the course of study). Reflexive science, on the other hand, allows for direct participation in the world we study, and actively supports a dialogue with the participants. There is no detachment from the data that is interpreted using cognitive maps. Instead the multiple (level of) dialogues with the empirical phenomenon are embraced by the researcher in a bid to take the general from the specific, moving back and forth across space and time (Burawoy, 1998). 'Reflexive science', according to Burawoy, has an edge over positive science by virtue of having a contextual richness the latter, by design, does not encourage. If positivist science distances the object from the observer, Burawoy recommends a strong interaction or dialogue between the two. Such *intersubjectivity* between the participant and the observer enriches the interpretation of the observations and creates a richness of context that may be underestimated by the researcher. In the process, it also lends an active voice to the participant, bringing her experiences and anecdotes into a frame of reference that is spatially and temporally distanced from its actual occurrence in what Burawoy refers to as "leaping over space and time" (p. 5). In other words, a worker in the match factories, in response to a question in the research field, could bring in a narration or context that was historical in nature, or geographically far away from the workplace.

From the lens of reflexive science two sets of simultaneous dialogues are highlighted: the first between the observer and the participants, and the second a dialogue between "local processes and extra-local forces" (p. 5). A third dialogue, he argued, happens between the theory and itself; in other words the capacity of theory to accept anomalies and make corrections (Kuhn, 1962; Popper, 1963). This is

the approach of studying apprenticeship and knowledge production at the workplace, even as there are larger forces acting on vocational practice through policy and politics. In the context of observing the knowledge production at the matchworks, the extended workplaces (beyond the physical), the historicity of the work context (going back and forth in time at the matchworks), and interrogating the valuing of work in changing economic demands (politics of vocational spaces beyond matchworks), can be plausibly examined through this framework.

The Extended Case Method (ECM) facilitates participant observation to link a local situation to an extra-local and historical context (Burawoy, 1998; Muhr: 2008, p.98). Burawoy (1998:27-28) provides an example of including historical research in the Extended Case Method. Trotsky (1879-1940) viewed the influence of history by placing himself in a context that recreated conditions of his subject of study. I use this approach to place myself in the context of the later industrial revolution period of England within the same industry that I have under scrutiny (Arnold, 2011; Beaver, 1985; Crass, 1941). The Match industry in England saw technological change as well as a social recognition (not always of the right kind) similar to that of the match industry in my research site in South India. The difference of over 130-140 years, as well as geographic distance, is noted. Yet the sociological dimensions of work seem in many ways unchanged. The controversies that attracted the public eye due to issues of safety (Chandrasekhar, 1997; Sartre, 1982; Wynter, 1979) or fair conditions of work have relegated the process of work at the workplace to a far corner of practice or research.

Many of the past researchers have focused on the economic nature of the matchworks enterprise (Chandrasekhar, 1997; Moulik & Purushotham, 1982). They looked at the economic consequences arising from changes in the demographics of workers like child workers (Chandrasekhar, 1997). Taking the connection of the economics of the technological changes that eradicated child labour in the matchworks, Hilding, Swain and Vidyasagar (2011) analyzed the impact of duty and tax structures, and how the industry reorganized itself to adapt to the newer



economic conditions so as to stay competitive in the marketplace<sup>29</sup>. They draw upon historical trends that enabled the industry to compete with Japanese manufacturers in the 1960s to explain the current trends seen in labour demographics. Arnold (2011) traces the historical events of the 1884-1927, highlighting the working conditions and wage-driven factors that caused intermittent conflict for several decades in the Bryant & May match factories of East London, highlighting the *Matchgirls strike*<sup>30</sup> of 1888.

Oishi (2004) touches on the community-based historical factors that affect scale and the balance of trade for the match industry but does not focus on the sociological and political impacts of how the workers have engaged with the matchmaking enterprises. Most of the studies quoted above have used secondary data and empirical work related to largely economic factors. This study attempts to draw similarities with historical practices addressing contemporary practices, arguing that there is a continuity amidst discontinuities of political, social and economic processes.

Burawoy suggests four stages in the evolution of the methodology as a reflexive science- a) *intervention*, b) *process*, c) *structuration* and d) *reconstruction*. Intervention occurs at the point of the participant actively engaging in a dialogue with the observer, bringing two different pasts into an active exchange of questions and answers. The participants can bring in examples that are beyond the context of the interview. There is an engagement with each of the participants and the artifacts of knowledge flows in the system. Reflexive science, as compared to positivist approach of testing the hypothesis, relies inductively tracing connections to the research questions or inquiry, at the same time aware of the structuring role of theory in seeing. Reflexive science therefore emphasizes the study of the everyday

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<sup>29</sup> The Tax-structure currently determines the work organization and extent of automation. The Tax structure therefore is peripheral to the working conditions and workplace social order. Please see Appendix-VII

<sup>30</sup> The much publicised industrial action by the women match workers in the Bow factories of Bryant and May, 1888 <http://spartacus-educational.com/TUmatchgirls.htm>

practices through the viewpoint of its structuration. In the *process* phase observations are extended across spatial and temporal distances. The insights that extend out from the observed processes to the larger ‘forces’ beyond constitutes the structuration phase. Lastly, the researcher’s ability to extend existing theory or refute current discourses based on the first three phases is an act in continuity: it does not evolve a new theory *tabula rasa* from the data - as in grounded theory (Burawoy, 1998, p. 16). In other words, it extends theory (Novelli, 2004, p. 95) by engaging with the real world through the earlier three phases that are characterized by ‘dialogues’ or active interactions at each level of the research activity, providing a *reflexive* or engaging way of illuminating inquiry (Burawoy, 1998, p. 5). This is represented in Figure 4.1.

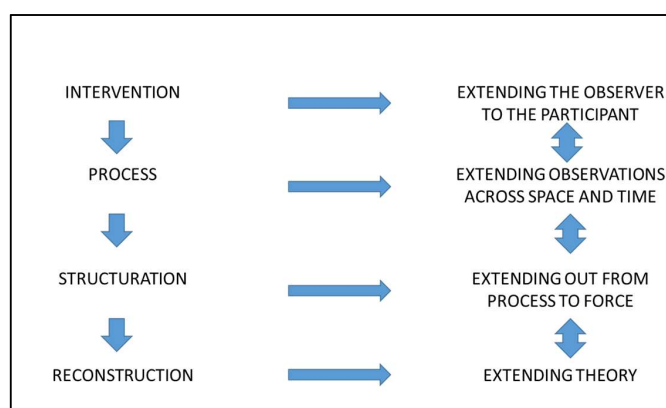


Figure 4.1. Novelli’s (2004) representation of the Extended Case Method

Also, the research method has to ensure that the experiences enhance understandings of the research objects. Deploying the ECM supports participant observation as an ethnographic tool (Hammersley & Atkinson, 2007), and allows analysis from semi-structured interviews and the artifacts outside but (not external) to the situational variables.

#### 4.5 Engaging with the Field: the “How”?

Martin Bulmer says that methodological strength is not limited to the reliability and validity of the results being obtained: in a sociological context, the *understanding*

and *explanation* of social phenomenon is balanced on the effectiveness of problem, theory and method (Bulmer, 1977, p. 33).

The “how” of this study came from three important decisions: a) decision on the location; b) decisions on the sample - who, how many, from where; and c) a reconfirmation on the match industry, and its *ecosystem*, for the representative sample. These are discussed further in this chapter. An ethnographic approach (not entirely ethnography), as suggested by Green and Bloome (1997), was adopted to observe and examine the contextualised knowledge that is situated and practice-based; in other words, a study of workplace learning or WPL (Avis, 2014, p.46). In contrast to decontextualized or formal knowledge that starts with *a priori* definitions of learning and knowledge, in this study an ethnographic approach begins by asking what counts as learning and knowledge, oftentimes co-created by two or more individuals, in an *in situ* context. It is with this premise that I approach the research questions of knowledge production. Green and Bloome (1997, p.17) contend that knowledge and learning are inseparable from their cultural and social considerations and are treated as folk terms by members of the community, a theme pursued through this study.

As discussed in Chapter Two, the match industry demographics (see Appendix V (a) & V (b)) and their clusters offer a ringside view of vocational practice in a changing workplace where technology is redefining traditional workplaces.

#### **4.6 From Data Collection to Analysis**

Archer urges asking questions that reflect how human being’s work. She says that being human is dependent on the interactions in the real world where the practice takes place (2000). From the initial coverage of the workplaces, the approach of this study was to examine and describe human interactions as they occur (with some randomness) in their own surroundings. The observations, interactions and inferences were dynamic and reflexive; it was not a linear process. At times, the

conversations were iterative and so were the conclusions, acceding space to the observed within the observations. The qualitative approach of understanding skill development through the apprentice's learning occurred with the emerging presence (identity) and the reflections *in situ*.

Similarly Popper (1974) makes a plea for 'being ordinary', taking significance from the objects of daily life and routines. He denounces categories, relegating them to a different world from *normal* people; an approach I used to pick up the stories and vignettes of ordinary workers going about the livelihoods in the match industry. As embodied agents of knowledge production and transfer, these ordinary workers offer critical perspectives through the study for larger themes of workplace learning.

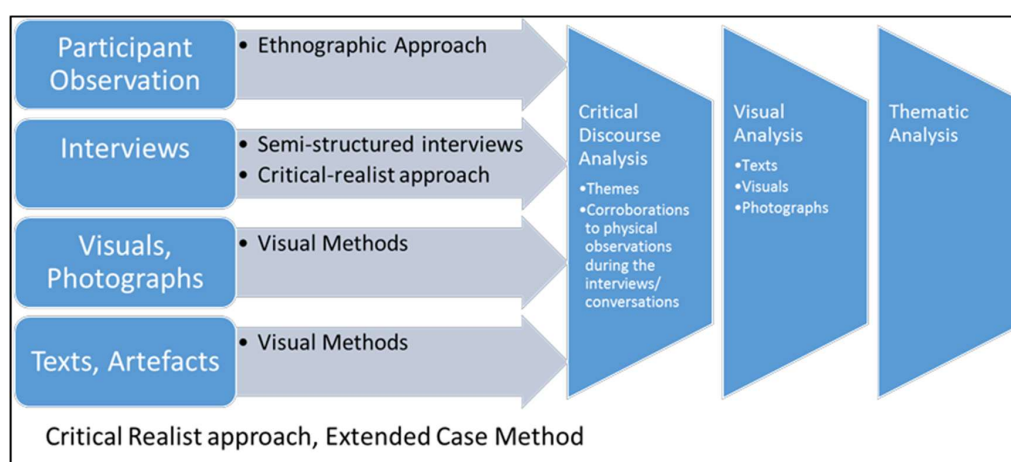


Figure 4.2: The Research Process Schematic

#### 4.6.1 The Sample

The fieldwork generated a core of twenty-one interviews with *primary participants* or those whose experiences, perceptions and engagements with the match industry were of central interest to the study. Based on the participants' accounts and the negotiations they had on a daily basis with others in the matchworks ecosystem, a further list of thirteen *secondary participants* were generated. This provided a deeper view about the nature of work and how the workers negotiated their learning spaces and events amidst their livelihood routines.

Both the primary and secondary participants were drawn across 12 match units in 6 specific locations within the two clusters of Gudiyattam and Virudhunagar (see map in Appendix III) in northern and southern parts respectively of Tamil Nadu, a state in South India.

	<b>What?</b>	<b>How?</b> Phase 1	<b>How?</b> Phase 2	<b>Analysis</b>
<b>WHO/ WHEN?</b>	Discussions with Policymakers: Individuals, Bureaucrats, Colleges of Vocational Education	August 2014 May- Sept 2015 Feb-Mar 2016	June-Sep 2016 Jan-Mar 2017 June-Aug 2017	Partial Analysis as the data collection progressed November 2017 onwards
<b>DATA PRODUCED</b>	Initial Insights into Policy direction	Thick description of the matchworks, related workspaces, Primary Participant interviews; information of the policy interfaces	Secondary interviews, interlocutor-led data points Policy inputs and corrective measures	
<b>CATEGORIES</b>		Industrial Workers No or Low Formal Education	Automation or Wo(Man)-Machine Interface)	Gendered Inequalities in Learning (Testing existing stereotypes
<b>DATA COLLECTION</b>	Participant Observation Interviews Visuals/ Images/ Photographs Texts, Artifacts Descriptions of the work places	Ethnographic Approach Semi-structured Interviews Visual Methods Photographs and Field Notes Field Notes	Semi-structured Interviews	Visual Analysis  Thematic Analysis
<b>ANALYSIS</b>	Developing a thematic framework of workplace learning, pursuing questions of insights affecting learning at work	Developing methods of observing learning at work, interpreting pedagogical alternatives to effective teaching-learning and incentivizing learning at work	Validating the influences and impact of policy on vocational training and education	Developing thematic insights from individual experiences; Objectivising workplace knowledge; creating categories of artefacts of such knowledge,

Table 4.1: The Research Process – Steps and Timeline

The bulk of the respondents of the primary and secondary participants came from a cross section of all the units performing various tasks in the units. This approach provided: a) coverage that was not restricted to any category or location and enabled some extent of verification of what the primary participants said, in interviews from the secondary participants; and b) enabled newer perspectives when the secondary participants raised interesting views that did not come up in the discussions with the primary participants. Interviews lasted between thirty minutes to sixty minutes and in six cases were done across multiple sittings to get deeper insights. Three of the primary participants offered their services at translation and served as gatekeepers for suggesting names to conduct interviews. Names were also solicited from the other workers during the interviews. A second dimension that was considered was a representation across the manual, semi-mechanized, and fully mechanized units, to be able to understand the impact of automation and how the worker perceived its influence.

Boud (1993, p. 80) categorized workers in “newly industrialised countries” that included India, Argentina, Brazil and Mexico. She further isolated sectors that represented women workers in a majority - in the process locating her studies in textiles/garments and food processing - that employed three quarters of the women’s industrial employment (a bit dated now, in 1982). Thirdly, she named her exclusions of women workers in support areas like secretarial staff or entrepreneurs, scoping the final research group as women production workers in food processing sector in India and those in shoe manufacturing in Mexico, and used case studies to build her knowledge claims. My sample of choosing the match works with the predominantly women-workers is broadly in the categorization that Boud uses: that of women in industrial sector excluding those in support or entrepreneurial roles.

Events were observed and recorded. Observations and thick descriptions (Geertz, 1973) of the individual contexts and workplaces were conducted and an examination of artifacts relating to the work, workplace, and individuals were recorded. The semi-

structured interviews ensured flexibility to explore n learning, women's learning and women's work.

In addition to the primary and secondary participants, five institutional respondents were interviewed. Three of them were in New Delhi, the national capital, where the policymaking machinery, including NSDC, was located. The remaining two were in the Virudhunagar district headquarters and provided useful perspectives on how the policy flowed into the regional spaces.

Twelve vignettes or individual stories were developed from the interviews and observations in the matchworks, represented a range of skills, a situational variable, or an emerging theme across the entire body of (primary and secondary) respondents. These are reported and analyzed in Chapters Five, Six and Seven.

#### **4.6.2 Visual methods**

Visual imagery is never innocent and is subject to influences and circumstances. Rose observes; "...it is always constructed through various practices, technologies and knowledges'" (p.32). On the one hand the visual images assist the researcher to have a better understanding of the field, and on the other had there is a need to understand any bias including that of the source of the picture. The researcher has to maintain a balance between having the image as an accessory and becoming an unwitting accomplice to any prejudice of practice or technology. Rose helpfully suggests a critical approach to visual images: one that thinks about the agency of the image, considers the social practices and effects of its viewing, and reflects on the specificity of that viewing by various audiences including the academic critic. In other words, she suggests considering the surroundings of the picture to be able to decipher its message from both the meaning as well as the context.

During the collection of data, I took pictures and videos where and when allowed. The pictures were broadly in three categories: a) that of individuals in the



workplaces, where they gave consent and signed the form that was in English and the Tamil language; b) of workplaces where there were no individuals in the frame, however there was machinery and the context of the work and comments on the process; and c) of neutral workplaces or street images that were used to increase the depth of description of the matchworks ecosystem.

During the pilot phase, I experimented with the visual images and used the images to describe the work location in greater detail than the field notes. The video graph images contributed to capturing the visual context as well as the verbatim comments of the respondents. As the camera panned the surrounding the description of the workplace was enhanced. I used the same combination in the matchworks locations. The limitation was with the consent that was not always available for all the respondents. In all the places, as explained in the section on Ethics in Chapter Four, I showed the images to the respondents and deleted any that were not acceptable to either the respondent or the owners of the units.

To be able to explain the images I turned to Rose (2001) for the analysis of the images in the workplace. She says there are three modalities to each of these sites: technological, compositional and the social. The technological dimension is related to the taking of photographs, that is, the perspective with which the photographs were taken to record observations, the level of the eye and the scope of the picture, eventually highlighting the object of discourse through the frame (Rose, 2001, p.40). The compositional element is the technique with which the image is framed. For a moving image, there an additional effect of voice or sound, as well as the context of the picture itself that adds to the depth of the image (p.51). The technological aspect of the picture enhances or blurs the image on the kind of shading used. However this was a huge issue for me, as all the pictures were randomly taken as the conversation progressed with the respondents, keeping in mind only the context to be covered. The photographs also served as a useful identifier when I was indexing the responses from different locations and creating categories. This was recorded against each respondent category in the Location Index (Appendix II).

As an ethnographic tool, visual images in the form of photographs allowed for a new perspective of the image that they represent (Weber, 1998, p.45), oftentimes jogging the memory or even offering a theoretical view that is elusive during the actual witnessing of the event. At the same time I had to remind myself that as much as the visual image served as a tool for validation, there were ethical considerations for each image. My reference for this was the ethical report of ESRC National Centre for Research Methods (Wiles et al., 2008). I have used photographs (where it was allowed) to assist in the memory of the event itself, as well as to print out the image and convert the adjoining space (sometimes formatted) to write comments and observations of the event itself, *post hoc*. This allowed for some reflection on my part as I noted the comments; in addition, the notes facilitated follow up actions relating to the event.

Where videography was consented to by the participants, I made an attempt to record the workplace so as to capture the nature of the technology there as it related to the process of matchmaking, and individual workers. All the ethical norms adopted for visual images discussed before were followed for videos as well. The videos were taken from a handphone or a small handheld camera, in order to secure: a) the flexibility of capturing the process adjacent to a discussion; and b) to collect a continuous activity that was also often a description of the apprentice was learning or the expert demonstrating her skill. Videography was not permitted by the owners in most the workplaces, as there was initially a fear that any information that went beyond the research might attract unwanted trouble from the authorities. I ensured that each video was shown to the individual and several of the instances were requested for deletion, which was complied with at the site itself.

The meanings of an image or a set of images are made at three sites: the sites of production, the image itself and its audiencing (Rose, 2001, p.25). Audiencing is the process by which a visual image has its meanings renegotiated or even rejected by particular audiences watching in specific circumstances (Fiske, 1994). Rose (2001, p.25) suggests three components to this process, that influence our understanding. These include compositionality, technology and social practices and identities.

*Compositionality* is the process by which audiences conclude individually and collectively, the context and make their own interpretations of an image. The interpretations can be individual, or through a discussion, or even debated, resulting in a collective interpretation. Since all the images were taken by me and categorized, compositionality was restricted to my actions without any other influence. I questioned myself if there was something I had missed out. However, some of the pictures embedded in the respective sections had to be slightly modified for any residual identification of individuals. This was duly corrected in subsequent edits.

The *Technological* site is where the meanings are made and enable the audience to be sometimes controlled or influences by the technology behind the image. 3 D screens, interactive screens and the lighting of the image or even the fixed or moving images can have a manipulated reaction from the audience. A picture in a book can have a different audience when compared to the same picture on a computer or TV screen. This is due to the technology differentiator that alters the medium of communication even as the content remains the same.

*Social practices and social identities* play an important role in the audiencing of the messages. An image that is fixed by itself on a wall is likely to have a very different compositionality, as far as social practices and identities play a role. In other words, the expectations and interpretations of the images as seen in the former are different from the latter. The effect of the physical place, the expectations from the audience, the imagery, and the imagination could be varied even though the technicalities of visual impact remain unchanged. There is a body of work that advances the notion of economic processes being embedded with cultural production that eventually results in visual imagery (Rose, 2001, p.20). The machine that Ravi Mechanic (Chapter Six) operates or the process line of automated dipping (see the stage in match making process in Appendix X) reflects this action enabled by technology. In a related argument Harvey (2009) draws a strong correlation between the effects of capitalism and the importance of images, contrasting with the purposes that were not evident in the past. This comparison came in use when I

studied the pictures of the historical match factories in the United Kingdom (Beaver, 1985). The pictures offered similarities and differences in how the overall manufacturing processes have remained the same, even as each process underwent innovations through technology. The same was evident in some of the locations that I visited when manual processes like *dipping*<sup>31</sup> were replaced by automation processes. The comparative images assisted the differences in the method but retained the process characteristics intact over a temporal frame.

#### **4.6.3 Semi-structured interviews**

Rubin and Rubin (1995, pp.196-97) suggest three key elements while preparing for an interview: the first is the relevance of the questions to the subject with key words, references to events or processes. This is followed by the smooth flow of one question to another that seems logical to the participant. On this point, I relied on an inductive mode, sometimes picking on key responses or words or demonstrations from the participants to ask their next question. However, a third point of Rubin and Rubin (ibid) kept me on track, that is the fidelity of the interview conversation and the flow of questions towards the research design. The pilot exercise assisted in fine-tuning some of the questions and the application of Pawson's (1996) realist framework enabled the examination of workplace detail on a vector mode going into the mechanisms and causal factors behind the visibly obvious (Tolmie, 2011).

Workplace stories nuanced understandings and practices of work (Orr, 1998, p.12) and learning, and were given importance by recognising the characteristics that Rubin and Rubin (1995, pp.231-232) highlight. They ask the researcher to be looking for signposts that a story is coming along - a seemingly unrelated reference to the answer being asked, an emotional change in the tone, the possibly of a dramatic representation, or a halting reference to an event. I looked for such pointers and questions like – “tell me about a time when you had a big challenge that you now laugh at?”

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<sup>31</sup> This is one of the key stages in the Matchmaking process. See Appendix-X

Two different questionnaires were administered to elicit information through the discussions with the respondents. The first was for policy makers and those who were closely related to the policy process, administrators and research team members of National Skill Development Agency (NSDA), National Skill Development Corporation (NSDC), technical officers of the training institutions and skill development partners (Appendix XII). The second set was used for the practitioners in the match works - owners, workers, apprentices and internal experts (Appendix XI).

Until the first phase of data collection ended in September 2016, I had relied for translation, in addition to my own comprehension of the local language, on my two interlocutors. When I discussed the first data set with my supervisors, we also discussed the ethical considerations of the two-language formula that was used to capture the nuances of the workplace in the non-urban setting of the match factories discussed in Chapter Two. An improvisation was made by creating a Tamil (local language) version of the questionnaire that was shown to the participants with basic reading skills (Appendix XI). In some cases where the participants could read basic Tamil, they signed the consent attached with the interview data sheets that were read out to them word by word. In the raw data sheets, the individual responses have been correlated with the level of literacy and used in developing the larger themes.

#### **4.7 Critical Discourse Analysis (CDA)**

During preliminary investigations, and in the pilot, I explored the use of critical discourse analysis. I adopted a similar approach in the main study with the application of CDA limited to analyzing the information arising from several of the policy documents, visual images and artifacts. In other words, the artifacts of match processes, documents that reflected historical similarities and contrasts to the match

units under the study, and the social messaging of the workplace reflected in the artifacts were only subjected to CDA.

As an example, whilst indexing the images served as ethnographic tools, CDA came in as a useful accessory to record and analyse my own reactions to a participant's narrations or answers in that event, at the end of the day, away from the workplace. I printed out a digital image on a sheet and put my comments from physical observations to the printed image. The interviews were conducted even as the participant and I were going around the workplace or discussing at the work location. The advantage of the walk-around is being able to 'see' the 'talk' of the participant. CDA is used to analyse the meanings from such conversations. I veered towards Harvey's explanation of the 'moments' of the social process (pp. 78-79), and the way human beings relate to each other through cooperative structures, divisions of labour, social hierarchies, access to symbolic activities and social power. It is such moments that I hope to sift through from the interviews through CDA, not limiting it to the language codes alone.

CDA assists in unravelling the relations between one constitutive element of the social process to the other social elements in what Fairclough refers to as a 'dialectical-relational' approach (Fairclough, 1998; Chouliaraki and Fairclough, 2010, p. 230). The elements, he contends internalize each other, and depends upon the social institution that envelops, governs or enables the order of discourse (p.40). In other words, one can draw conclusions on the specifics to the event and the institutional norms, practices, and possibly even the power structures. The elements are connected, hence relational. Being different, yet not discrete by themselves makes them dialectical (ibid-231) and internalize each other (Harvey, 1996). Their appearance is often partial or misleading, as the institutions are dynamic and extend this dynamism to their embedded processes.

Analysis is thus required to examine and explain the relations (Fairclough, 1998, p. 31). The pointers from CDA illuminate the *structures* (and the structuring of the social practices) or draw the focus on how the social agents achieve their outcomes

or objectives within the structures and practices (Fairclough, 2010, p. 233). Fairclough calls the latter as the *strategies*. It was through this process that the Vignettes emerged, that are explained in Chapters Five, Six and Seven. Within the vignettes, using CDA helped understand the conditions of knowledge production (structures) and how it shapes and is shaped by the individual as a strategic actor.

#### **4.8 Reflecting on Methodological Issues**

In order to *understand and explain* social phenomenon and not just to describe them, Srivastava (2004, p.51) suggests an emphasis on the facts. These facts, he argues require a frame of reference and theory to guide the research; from a) the formulation of the problem to b) collecting the data, and c) its analysis. There is subjectivity and selectivity in each of the three stages and I note two specific areas that have consciously been a part of my journey where I had to return to my own thinking processes repeatedly to be able to *understand and explain* the knowledge production in the matchwork places.

The workplaces of match production present a visual imagery, a continuous impinging of thoughts and images on an observer's brain and mind. A question of how a skillful act is performed will be answered by an action, not always a verbal response. In such a case, understanding the ethnography of visual methods (Pink; 2003, 2007) offers a useful insight into not only interpreting the first visages of the workplace (Tolmie, 2011) but also a useful guide to record and retrieve the information captured (Edwards, 2002). The approach does take us towards a better understanding of the *performative* nature of the skill in the workplace. It does not, however, restrict us from exploring a newer or more contemporary description that reflects workplace realities or a *stipulative* definition for the skill. In taking the route of making the voices from my participants heard, and reconstructing the meanings from the images of the work, the workplace and the production process (Pink, 2007; Rose, 2001) I aim to make meaning from the notes 'at the interpretative level (as) ethnographies remain delicate cultural constructions intricately interlaced through a

diverse community of tellers, listeners, writers and readers who in turn may unravel and string together these “truth regimes” differently’ (Nayak 2006, p.412). In other words, locating the match industry in dichotomous situations, and relying on both the observed with the abstracted, is only possible with inductively unraveling what is seen, heard or experienced, within its cultural and historical contexts (Narag & Maxwell, 2013). In the pursuit of stories, anecdotes and perceptions of the individuals, the work environs tend to take a backseat; at best they are described in a static physical form. In the narratives that emerge from the description of the workplace, I have attempted to capture through static as well as videographed images the physical working environment amidst which knowledge production and transfer take place. The abstraction follows from multiple sources, however the primary focus continues to be on the industry in its evolving state - technologically and economically. The acclimatization or the absorbing of the ‘sights and sounds’ of the workplace came to occupy an element of significance after my second round of data collection. In a discussion with my supervisors, I narrated an event and read from my notes about the “noise of the machine” and my need to shout above the loud environs to be heard. This led to a discussion of how the workers adjust not just to the loud noise but also learn to control the process when the routine sounds are distorted. In other words, a particular rhythmic sound ceasing could draw the immediate attention of the expert worker who determines that there is a problem with the machine or the process and immediately turns his or her attention to fixing a problem. This is neither highlighted by the worker in an interview nor considered as anything outside of ‘normal work’. Wood (2008) talks about a similar acclimatization of workers to the workplace sights and sounds in his work relating to weavers in Mexico. The question of how much to make visible helped keep my reflexivity compass during the interviews and analysis phases.

Srinivas (1966), a western-educated sociologist, pioneered sociological studies in India, touching upon areas that are unique to working in the Indian context. In a broader way, he also addresses the issue of a sociologist understanding his own society. Using an Indian village as a foundation for his ethnographic studies, he argues that in the pursuit of a topic that investigates the cultural depth in a narrow



area of the society, the researcher could, by virtue of being closely associated with identities of the society that is her own, be “myopic,” or ignore the larger changes that pass through the research frame. For this, Srinivas suggests a ‘structural-functional’ view (p. 157), which permits an objective analysis from a physical distance. In my research, stepping away from the physical and temporal proximity of my research field happened in two ways: an immediate distancing when I travelled back to Bangalore that was my home base in a different province, yet significant in social similarities in many ways to my research field; and an ‘ethnographic distance’ (Srivastava, 2004, p.23), a greater distance of the mind from the immediate conversations when I spent time away at the University of Bristol, that gave me an “external point of view (Madan, 1966, p.12). Srinivas, drawing from his learnings from reviews of his own work by Dumont and Pocock (1957) and E.R. Leach (1954), concludes that a sociologist in his own environment has both advantages and disadvantages. Madan (1966) calls this the Dumont-Pocock method of sociological studies in India. It is the disadvantages that he pedagogically recommends the researcher to pay attention to which I have also addressed in my ethical considerations.

Bourdieu refers to practice as a meeting place of the *opus operatum* (essential features of practice) and the *modus operandi* (generative principles of the practice) (pp.12-52). A dialogue between the two allows for understanding the how and what of an observed event. The objective of my study is to get at the essential features of vocational practice, *whilst* studying the details of what makes knowledge work in the work place.

## 4.9 Conclusion

This chapter elaborates on the overall paradigm, methodology and methods that I used in the study of matchworkers in the matchworks industry in South India. The study draws upon a critical realist social ontology, whilst an ethnographic approach involving multiple forms of data gathering was deployed (visual, interviews,

documents and so on) so as to generate thick description of workers, workplaces and learning. The Extended Case Method pointed to the importance of extending theory as well as connections over time between earlier forms of the production of matchworks and contemporary practices in India. The overarching question still remains: who teaches them and how do they learn? It is to the exploration of the data that I now turn to.

## **SECTION 2**

### **In The Workplace**

## **CHAPTER FIVE**

### **In the Workplace I:**

### **Valorising Informally Acquired Skills**

#### **5.1 Introduction**

All work and work-related learning is premised on the notion that the acquisition of skills might lead to degrees of mastery and expertise that is either formalized in the form of credentials, or implicit in understandings amongst workers and employers. If formalized, pathways are often constructed from a series of steps showing the path toward mastery. The learner's task is to navigate the system, whilst the system itself periodically monitors progress and produces evaluative statements, such as the achievement of skills, which are translated into learning outcomes.

However, in non-formal workplaces, an important question arises as to how individuals acquire skills leading to their recognition as experts when the teacher-learner relationship not only sits in the shadows of the informal learning economy, but where the steps toward mastery are not stated in any formal way. What processes and pathways do they navigate to acquire and transfer their knowledge? It is known that tools can enhance an individual's abilities, but how exactly do they learn to use these tools? Also, how do these workers have their skills recognized in these workplaces, and use this recognition to secure their place as an expert and potential teacher of new workers? As I have argued earlier in Chapters 1 and 2, these are important questions in the context of India because of a large segment of the workforce - in excess of 93% - are in the informal sector (Bremar, 2013). Within

this segment, there is a low level of participation in formal technical vocational educational and training or TVET (UNESCO, 2011) and yet it is also this sector that is expected to help boost development in India to enable the movement towards becoming a knowledge-based economy.

This chapter begins the analytical work on the data that has been collected to explore the questions posed about the workplace knowledge production, and offers explanations. An explicit aim in my analysis is to make audible the voices of the workers, and in doing so, metaphorically bring them out of the shadows of the informal economy and non-formal learning. This is accomplished via a series of stories I am calling 'vignettes' using their voices. These different vignettes are drawn from the sites of my ethnographic investigations of various matchwork industries. At one level, the vignettes by themselves relate to individuals and their immediate workplaces. Yet at another level, they also provide both a vantage point as well as an entry point into exploring and explaining the less visible aspects of learning, the learning processes embedded in the routines of work, and the emergent learning moments. Knowledge production is seen *in very unique situations*. However there are common threads that support learning and its transfer to newer entrants in the workplace. At the same time, there are also dissimilarities that do not allow the observer to standardize learning or to develop a template that generates observations of particular kinds of practices.

## 5.2 Valorising Skill

### Vignette 1: Sripati

*Sripati, works in the annexe of the match unit, preparing the machines for installation in one or the other manufacturing lines in the factory. He is acknowledged for his skill in re-engineering or re-purposing a machine that is defunct, and being able to use sundry parts, so as to make the machine whole again. I am introduced to him by my interlocutor and he nods a greeting. He is initially wary, but as I continue to walk around, he becomes less conscious of my presence. Observing him for a while and noting his surroundings, I have a list of mental*

*disconnects in my head as he is working using his fingers, without any writing or reference to diagrams or documents. He uses a small pencil to mark the components with symbols in what seemed to me like unintelligible notations. He picks up a measuring instrument in one hand and is working on a component in his other. I draw his attention to the metal piece, while standing in front of a workbench with one part of a machine assembly, now dismantled with several parts placed around the workbench.*

Researcher: *What task are you performing?*

Sripati: *I am checking the uniformity of this...it is important that it stays at 30 mm.*

Researcher: *Can you show me the length of 100 mm?*

Sripati: (No answer. He looks blank).

Researcher: *How do you know how much is 30 mm.*

Sripati: *No.*

Researcher: *What class have you studied up to?*

Sripati: *8<sup>th</sup> Standard* (mutter).

Researcher asks him to repeat: *8<sup>th</sup> failed*, he says.

Researcher: *What is the machine in your hand?*

Sripati: He shakes his head.

*Sripati continues to sandpaper the metal piece in his hand all the while measuring its uniformity with a deftness of hand as he rotates the metal piece in his left hand and the measuring device in his right, a sandpaper at the same time wedged between in his fingers. All this while talking to me.*

Sripati (Primary Respondent, PR- 8, 2017) expertly held the vernier calipers in his hand, measuring the width of a foot-long metal shaft of the machine that he was repairing. His job was to repair the automated machines in the annex of the match factory. The complicated machinery he repairs makes him a sought-after expert; indeed a self-taught one. He has four apprentices, choosing whom he wishes to train. The owner of the factory (Primary Respondent, PR-1, 2017) mentioned to me that he lets him choose his trainees, as he understands the aptitude of the learners the best; those whom Sripati trains, are good at repairing work like him. The criteria are not dissimilar to what Julian Orr reports on in the way service technicians at Xerox chose those who they felt could be trained (Orr, 1996). He encounters situations that are uncertain and puzzling, demanding his experience and skill in constructing the solution from the problem at hand. He appears to be making sense of the situation that initially does not make sense (Schon, 1983, pp.39-40). As the solution emerges, it builds on the tacit knowledge that Sripati is evidently filing away

in his head, only to be brought out when he chooses who to train as his apprentices. He seems to be incrementally building up knowledge whilst at the same time being able to share knowledge and practices, and possible solutions to problems, with his apprentices in ways that are unlike how he learnt. His experiences are codified into a small but scalable model, albeit within this very small enterprise.

Sripati has found a way of accurately measuring without being dependent on the formal language of the vernier calipers. The assumption that the principle of the measuring instrument needs to be understood is under test here. In a formal learning environment, a student would have undergone two steps of being taught: the first is the principle of what the vernier calipers does as a measuring instrument, with its way of working. The second is the application of how it is used to check the uniformity of a component and its dimensions. Connecting the two, the learner would arrive at the conclusions of uniformity or lack of it on the component. In Sripati's case, his learning has circumvented both the steps; the steps themselves are symptomatic of a credentialised process deployed in formal learning.

Credentialisation is one means of converting reason into a particular kind of calculation that becomes measurement; that in turn, references a standard. This is a positive step towards scaling learning into a formal framework. Yet it is also useful to note the historical shift from reasoning into calculation (Dreyfus and Dreyfus, 1986, p.203). They argue that the Latin interpretation of "reasoning or problem solving" that was associated with *logos*, was reduced to a diluted shadow of the same meaning in English to mean "measurement or calculation". I argue that Sripati has applied a simplistic approach that the caliper can measure a standard surface, without using a reference standard of measurement. In other words, the conversion of millimeters as a standard is of no use to him. He has adopted the reasoning route, instead of the measurement route whilst using the instrument. As a counter to this logic, at some stage he may face a future situation that demands a higher degree of numerical calculations. The reasoning has been applied without the dependency of understanding the standards, or in Dreyfus' words, the ability for problem solving has been acquired. In transferring to others his own perspective of machine repairs,

he has redefined the scope of his own work and the descriptors of skills. Using the exemplar of the caliper's use by Sripati, I focus on the non-formal acquisition of knowledge in the absence of a credentialised approach using standards.

What sense do we make of the difference between Sripati's complex, dynamic and implicit knowledges in the workplace and with his apprentices, compared to a worker acquiring a measurable job description with defined inputs and outputs that also reference skills to a measurable standard? Whilst recognising the positive consequences of ensuring there is recognition for the learner, there is also a significant loss: that of process, and the richness of contextual and experiential pattern recognition, that in turn transcends cognitive boundaries.

## **Vignette 2: Sundari Akka**

*My first lesson from Sundari Akka was to understand the safety in my surroundings. When I first started working in the match factories, my family was worried about my own safety, since there were so many accidents. Even before I learnt the work here, I learnt what it means to loose **vaalkkai** and **aadharam** (life and livelihood). So today that is the first **ceyti** (message) I teach to all my learners; the young people who come here. Safety is not for doing the right way, but to do the right thing... it is more than the task. Here, look at how I am holding this tray. If it is not at the right tilt, it could give a wrist pain by the time one gross<sup>32</sup> is done. It affects not just life but livelihood. It is in our interest that we have to keep safe at work. What is there to learn on the work, if not for all the things around the place itself. Not many join this work, but for those who do, I want to let them know the other things ...I walk and show them all the places in the unit (factory). This is a critical process.*

(Primary Respondent, PR-12; Secondary Respondent, SR-1, 2016)

What is Sundari's way of teaching her apprentice telling us here? In the non-formal workspaces, the importance of work as a source of income is used as a prompt for teaching. This is also a crucial aspect of the work itself. Here the learning process places the actual work-related training to second place, prioritizing the learner's safety at the workplace as a pre-requisite to any further training. Is this different

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<sup>32</sup> Measure of match boxes: A dozen dozens, or 144 units



from de-contextualised learning environment, one might ask? However, we could say that Sundari is connecting the concept of safety not just to the physical environment of the learner but also to the possibility of a livelihood being jeopardized, or even a life being placed under threat. In other words, she is focusing, in a very holistic way, on essential understandings about the work, which she sees as central for the learner. It is this internalization of the context of work, which is key for the worker to acquire as she also progressively learns the work itself.

Both Sripati and the apprentice to Sundari, exemplify the tacit learning that the workers seem to have absorbed, and from there, then codified this knowledge into their own vocabulary and narratives when teaching others. The expert worker can continue to teach others in the way s/he has learnt without “formal literacy”. The vocabulary of this learning is, it can be argued, a different form of literacy. The vernacular of the machine, and the process, is decoded by the worker into a tacit knowledge, and then utilized, though initially it is by trial and error. Over a period of time, it is refined through the tacit knowledge acquired and stored across several experiences to build the individual’s skills. This knowledge is then transformed into instructions to new learners.

At this point we reflect on learning as a larger enterprise than simply formal learning. In this regard Engestrom (1991) talks about problematizing formal learning as a variant of the larger social theory of learning (Lave and Wenger, 1991). The larger learning enterprise includes a wide range of implicit or tacit, and informal processes. By acknowledging these through, as an exemplar, individual stories and anecdotes embedded in the work environment, I argue that there is considerable merit in both ‘legitimising’, and providing narrative spaces in the learning process. These, then enable the learners to internalize the tacit knowledge and practices, embedding the knowledge in their laboring. In other words, the message of safety discussed here, is institutionalized through the social nature of the teacher’s experience, on the one hand, and interpreted in such a way as to respond to the specificities of the apprentice, on the other hand. The significance attached to this particular knowledge is thus more effectively acquired and also valued, than a more distant

and abstract idea of “safety”, explained through generalizations, which the learner may or many not associate with. The concept of safety can be explained as a ‘contextually conditioned causal mechanism’ (Pawson, 1996, p. 302). In other words, Sundari’s learnability is in the ability to assimilate the situational dynamics, constantly changing whilst simultaneously unique, and adapt them to newer situations. The non-formal learner uses a *situationally legible*, therefore intelligible script to strengthen her understanding of the production process.

### Vignette 3: Arasu

*I am showing Arasu how to control the crimping process. You can see he is a bit nervous. I was too, when I learnt this first. (laughs). The machine came later. When I learnt the folding (he shows his hands) they were the machine! Arasu is here for 15 years, no 18 years....(looks at Arasu for a confirmation) and was keen on coming into this line. He has now been here for 2 months. He will learn, slowly, since he also started late. My job is to show him how “complicated” **velai** becomes **vachatiyaana velai**<sup>33</sup>.*

(Xavier, Primary Respondent, PR- 6)

Why does Arasu want to change his role in the first place? He feels that there is no purpose in doing machine work, apart from the main motivation that this brings him better pay. The correlation between pay and skill is not explicit. However it is an understanding shared amongst the workers (Arasu, SR- 8). In the absence of formal hierarchies, there is an indigenous hierarchy in the workplace that is not related to qualifications, pay, or the years of experience. In the smaller industrial units that are categorized as formal, yet which straddle the landscapes of informal labour (Boud, 1993; Breman, 2013, pp.32-35) (including the matchworks) there is no formal hierarchy of jobs or any correspondence to qualifications. The latter is beginning to emerge in a small way in the larger units that have become completely mechanized- and there is increased guidance on how to have persons with qualifications running

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<sup>33</sup> Work that is made easier or comfortable, or similar meaning, in Tamil

machines with power specifications or chemists with specialisations to be working in the laboratory to do the chemical mixing (PR-2, 2017).<sup>34</sup>



Figure 5.1: Transfer of learning through spaces

Here we can argue that what might be considered difficult work becomes a comfortable piece of work, especially when the expert tutor finds common ground with the learner. Arasu's motivation to learn is the right kind of demeanour; a starting point for worker experts like Xavier, Sripati or Sundari to look for in their apprentices.

The crimping machine is a semi-automatic process where the vertical feed converts a flat sheet of thick paper into a three-phased contortion forming a folded box, open on the flat upper side, that fits into a matchbox frame - the later half of the machine's movement converts from vertical motion to a horizontal frame. The processed matches are then filled into this. The speed with which the frames tumble out of the vertical feed into the horizontal line is the place where the skill is needed to control the smoothness of the folds in the box. A small deviation from the track could damage several dozen boxes pushing them into convoluted shapes. The

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<sup>34</sup> This was recommended as part of the ISO International Quality Certification requirement that one of the units was aiming to achieve

aesthetics of the box apart, the operation needs to ensure the shapes take in 40-50 upright matchsticks in the next phase of the process.

There is a learning moment here. It takes form at the point at which Arasu takes over the line from Xavier who is teaching him. The keen eye with which the teacher looks at the horizontal feed is the point of passing over control to the learner by letting the learner operate on his own. The briskness with which Xavier moves to a lesser skill task in the line, re-arranging the filled in boxes at the far end of the line, enables his apprentice to take control of the line and to learn. In creating a physical distance in this way – whilst maintaining visual control, this creates the space for *the autonomy for the learner on one hand, yet allows for the continuity of the primary function for which both the learner and the teacher are employed. A hidden learning emerges from what is otherwise a normal work routine.*

So how can this dichotomy in the workplace, of needing credentialisation whilst at the same time limiting the potential corrosiveness of too much credentialisation, be calibrated and managed? One of the suggestions I have from observing people like Sripati, Sundari or Xavier, as they work is to address the issue of skills in two ways: to allow them to gain the benefit of recognition through a formal process, not akin to the conditions used in lifelong learning processes (Illeris, 2009), and not letting the formality of recording the process affect their own progression or knowledge transfer mechanisms after this milestone. In other words, substituting the current process entirely with a formal process is likely to be counter-productive and inhibit their original way of working.

The quantification of Sripati's output as a result of credentialising needs multiple iterations, and also possibly acceptance from him and his key stakeholder - in this case the owner of the manufactory. In projecting this to a scalable model, seeking such "home grown" experts, not unlike the IQ tests in a school system, is problematic. It has to be inclusive of indigenous forms of contextualized learning. In other words, it needs to have a way of including the *elliptical stories* (Orr, 1996) of Sundari and Xavier's *vignettes* (Pawson, 1996). Such stories illustrate the principles

of knowledge transfer - from expert to apprentice, as well as the empirical recording of artefacts (eg: an inventory of tools used by Sripati). Using codification formats that demand qualitative inputs, or encouraging visual descriptions or images, can enhance and even accelerate the learning experiences of future learners.

Can such anecdotes add up to a generalization? To an extent, they can. I discuss this in Chapter Eight, within the formalized framework of Qualification Packs relating to the National Occupational Standards (Sectoral Skill Councils of NSDC) that collect descriptors relating to how a job is performed. The descriptors are generalized versions of such practices. But they are also quite distanced from practice in the standardized language of English. I argue that including a statement mentioning, say, 3 stories and 2 vignettes, will enrich the contextual description of the skill required for the job performance. Or, put another way, by situating learning in contexts, but seeing contexts as part of the learning and not simply the occasion, generates quite a different sense of situated learning to that proposed by Lave and Wenger (1991). The contextual descriptors have the potential to offer semantic density to the practices being described.

Another way to ask this question is this: can we see Sripati's knowledge production and transfer processes as a framework? Is his charisma routinized, and can it be incorporated into codification, for replicability? The answer to the first question is affirmative, whilst to the second it is not. The replicability of individual 'expertise' characteristics is questionable. However, the factors that lead up to the individual becoming an expert can be unraveled and generalized to an extent. We see this approach being assisted by the Skill Model proposed in Chapter Six. Can credentialisation, therefore, help the worker, and if so, how? For Sripati, a diagrammatic representation of the tools as well as the purpose of the machines can save his time in the experiential assessment. This needs further research.

#### **Vignette 4: Anandan**

*I have been in the units for 20 years, but familiar with the match works since the time I have been a child. I started by carrying trays from the small units in the street I lived in for small pocket money- but mostly to help my neighbours- it was common. I don't like the work here, and have changed more than four jobs. It was not easy to learn some; I took more than a year to understand the machinery. I don't want any of my children- I have a boy of fourteen and a girl of twelve- to come into this, but who can say. These are the easiest jobs to get this town.*

*But we are like a family of workers. I know all the people who own or operate the units. The help I get from my own community to stay in this job is not possible elsewhere.*

*I asked them to change my job twice. But sometimes you have to struggle with the machine. I feel some people can do it better than others. That, I have accepted (To a follow up question on whether it is age-related, he shows me another person at the far end of the floor, and admits that even though they are the same age, that person is better. I did not see any difference in the way the machines operated).*

*...of course, I have trained others. I may not like the work before but it is alright now.*

*I could never learn from seeing the video. How can you learn? It is like TV, only to enjoy! (He chuckles). When I had a doubt, I would reach across to my neighbour (he gestures to his right, at the person who seemingly does a better job than him) and ask for help. I saw the way he performed on the machine, and learnt it.*

*I have taught several people now. They are all experts. I notice who is interested and who is not. Like me, there may be people who are not interested. But if they have cooperation, they can perform well. And get a higher unit rate.*

*Anandan, Secondary  
Respondent-12*

In the words of Alice Lam (2014), individuals are the principal agents of learning, even while their learning is embedded in social contexts. I analyse the rejection of technology-based or mediated learning here. Is it because of the inability of the person to learn through the medium of technology? Rather it is their apparent preference to learn in an active context. Some learners take easily to learning on their own. For them, the codification of the learning after an initial introduction to the content is good enough to start their own process of assimilation. For others, active learning within a group is important to not only push their own learning, but also gain acceptance within the group that they have skills of their own that can be valued. In other words, they have recognition of value by others.

I separate the *intention* to use technology, from the *ability* of to use technology in knowledge transfer from the individual agency to the structure. When confronted with technology, an individual feels she can comprehend and use the technology. However, the ability to use the technology varies from one individual to another: some may adapt faster than the others. In other words, some individuals have a capacity to use their agency to mediate using technology with the structures: even create newer structures. When technology activates the individual agency, new enduring structures are formed. Structures are rigidified social formations and are displaced with technology. When technology becomes an integral part of the workplace, and indeed the workplace learning, the role of the individual's ability to master and embrace the technology determines how/how much of the individual learning via the machine is transitioned to the knowledge collective around the technology-induced workplace. This is discussed in more detail in the automation-related sections of Chapter Six (Section 6.1 Vignette 1) and Chapter Seven (Section 7.2 and 7.4). At the same time, for the individual's knowledge to circulate beyond the temporal frames of my respondent, the institutional system can provide for those who wish to learn on their own and those who rely on their networks. I advocate for the 'genius of the AND rather than the tyranny of the 'OR' (Collins & Porras, 2004), asking for scalability and sensitivity to co-exist at the same time.

The tyranny of the monologics of the state's policy process, broadly top down in its approach, can overshadow the ability to make visible, and value, ground level or local issues when bigger or general institutional processes confront the particularities of individual capabilities. Valuing individual skill and its local aggregations at the unit level offers a set of possibilities for coexistence with formal policy mandates. I realize such choices would have been made in the past as well, and also in other domains.

Beyond the workplaces, the circulation of knowledge at a global level through the medium of technology is what caused disruptions and macro opportunities to individuals and institutions through globalisation (Burawoy, 2000; Saxenian, 2005).

Also my research objective - of taking the vocational practice from one location to a transferability of skills - arises from this problematic. In protecting the indigenous tacit-knowledge production mechanisms of shadow workplaces like the matchworks, there is an opportunity to take out and codify the learnings to a larger community of work.

### **5.3 The Social Context of the Workplace Knowledge**

I examine the events around Sripati, Sundari, Xavier and Anandan alongside the social properties that not only shape but constitute the workplace as a social space. Some of the inferences that follow are not visible in the first interaction. The field description and the pictures are of immense help here. As I analyse the picture I had taken of Xavier, the 'physical distancing' becomes clear. I go back to him the next day and question him again. It is then I conclude that there is a 'hidden objective' towards his training his apprentice, even as he maneuvers the physical space in such a way as to best allow autonomy for the learner and to create a conducive environment. The elliptical story of Sundari *akka*, and the envelope of workplace safety only makes sense when the physical environment of dangerous chemicals is laid bare through thick description. Anandan's contra view of all apprentices having the same motivations to learn, arise from his own reflections of experience, and unless explained may not include the variances in the non-formal learning.

In other words, it is Anandan's accepting a different view of the apprentice's motivations, which allows us to acknowledge that all learners may not have the same motivations to learn. Positing the underlying mechanism that generates desired outcomes - in this case the enabling of the apprentice is, in the words of Ray Pawson, a necessity that is drawn from 'contingent and conditional' mechanisms 'within historical or institutional contexts' (p.301). In other words, when a mechanism in context is illuminated, it assists in understanding the broader learning process with its uniqueness and similarities/differences with other events. This can be seen to be an emergent property of a consequence that does not add to the sum



of its parts (Elder Vaas, 2010; Roy Bhaskar, 1975). It allows me to move to a level of abstraction; to differentiate between what I see, and what I have inferred.

Ray Pawson (1996) provides us with a useful set of theoretical tools to help us explain social events that are woven into layerings of social reality. According to him, there are three features that need understanding: visible outcome patterns (O) in the shape of events, happenings or social properties, that are caused by underlying mechanisms (M), that provide some connections between agency and structure; and the contingency of such mechanisms to the particular social or institutional context (C) (p.301). By adopting this strategy, he offers a potential mitigation to what Giddens' argues is the limitation of an individual's 'knowledge' towards an action, but the resultant unintended consequences that might be caused by other factors in the situation, despite the individuals being "knowledgeable and reflexive" (Giddens, 1984, p.5). In other words, the actor is limited to his own intent towards the action but has no knowledge or control over the structural conditions prompting action, or the full consequences of the action itself.

I question the replicability of the knowledge produced from this learning moment. Is the learning that is limited to the uniqueness of the situation, transferable to newer situations or even replicable with similar conditions here or elsewhere? Would this be visible in other instances, if the size of the work organization was bigger? This took me to the variances I had in my own respondents' situations. Across my respondents, there were anecdotes of how the apprentices need to "*be given space*" (PR-6, SR-4, SR- 7). What is interesting from the similarities in such conversations is that the respondents come from very different physical locations within the industry. The abstraction is towards contextualizing the learning process with the right inflections of 'spacing', the appropriate moment that only the trainer is equipped within the situation. It is not limited to the cognitive abilities of the learner. Rather, it is the ability of the learner to be able to comprehend the overall situation and respond with multiple reactions to simultaneous stimuli around the workplace that is reduced to "maturity", in the eyes of the trainer. The outcome is, at the very least, affected by personal, moral, economic and social mechanisms of the actor.

Codification of this milestone, in my view cannot be done with the vector direction of a decontextualized test or passing of a vocational examination. It needs to be inserted into a real situation and deeply embedded for learning to endure. A meta-theme emerges from this observation in the themes discussed in Chapter Eight. Moving away from a position of substituting the formal with non-formal, I begin to see possibilities where coexistence of the non-formal and formal begins to emerge.

By allowing the respondent to contribute to the 'mutual knowledge' of the understanding the mechanisms, the research process is enriched through the semi-structured interview process that was conducted *in situ* in the workplace. Allowing them space, and the multiple interactions which seek to understand the "how" of the "know how" - offers a partial solution to understanding and scaling the vocational training puzzle. This suggests that we might think of the ways in which policy can assist the collection of situational factors so as to achieve a particular kind of desired quantifiable outcomes from skill acquisition.

I reflect on the possibility of having the skilled people to be able to disrupt the system. For example, what happens if Sripati doesn't like the work? Would he, as an agency of knowledge transfer, become a liability in turn limiting learning and productivity? As a human agent of Giddens's idea of the structure of domination (pp.92-93), Sripati represents the *authoritative* category- or the asymmetric power over people (versus the *allocative* power through control of resources). Probably, this would never cross his mind because of the close relationship with the employer. This is still a theoretical possibility. In a very real sense, what is implicit is not visible. Knowledge is being exchanged backward and forward in this or a similar workplace could offer a lot of meanings circulating in ecosystem. For a learner, this is important to imbibe soon after or as a part of the rites of passage.

Anandan's explanations, as acknowledged before, are parallel narratives to the motivations of apprentices. The connection of skill to employment to monetary rewards is illuminated with this case. The implicit connection of skill to monetary gains is muted so far, but Anandan's view brings forth an emerging theme of

incentivizing workplace learning. Some researchers in the past, whilst recommending policy interventions have been skeptical on incentivizing credentialisation (Wolf, 2011, p.154). The assumption that all workers are excited about learning is a myth that is challenged by Anandan. The need to work and pursue a vocation is accepted as a way of life. The trainer has a role to inculcate a motive to learn; to show an objective that is exciting to both the categories of the learner (she who is keen to learn), and others who may not have a choice. In other words there is an opportunity for both intrinsic and extrinsic motivation here. In the skill model presented by Dreyfus and Dreyfus (1986), there is an inherent assumption the pursuit of skills is a voluntary process. Anandan's interview sheds light on the possibility that all skill pursuits may not be voluntary, and the process of learning has to take into account the dichotomy between those learners who are keen and those who aren't, and the pedagogical binaries that might in turn generate challenges to organized systems of training apprentices. The workplace is thus a microcosm of such dichotomies in the labour market, and the learning process has to include the teacher's role in helping the learner maneuver between such challenges.

#### **5.4 Reconstructing a Tiered Ontology of the Workplace**

In the dialectic of the actor-structure, critical realists qualify the role of the individual, by not only appreciating the interpretations of the respondents, but also by examining and analysing the social contexts within which the individuals operate (Smith and Elger, 2012). Even as I took this approach, it was important at different times that I was particularly mindful of being sufficiently reflexive about the process itself. I had to be close enough to enable observation, yet sufficiently distant to enable analysis without losing the meanings that were emergent in the workplace. The sensory and visual experience of the four stories above emerged from the semi-structured interview process of *talking by walking around* and I considered them the *empirical* pointers within the layered ontology of the critical realism framework. The learning moments that were identified in the stories of my respondents were in the "domain of material existence" (Elder Vass, 2010, p.44) or *actual*, bringing out the

action in the seemingly routine events that the actors played out for, and as part the system. The learning moments are, I argue, emergent as a result of the causal powers of both the workplace structures and institutional histories, as well as the cognitive, social, and material motivations of the individual workers. An expansive learning framework in the workplace habitus (Chapter Six) and Anandan's individual motivations are exemplars of institutional histories and material motivations. In examining the knowledge production at the matchworks, the investigations and the descriptions of the unseen within the ordinary are understood as *real* causes of the outcomes; that is their actions. Collating the individual experiences, giving their voice a context within the ensemble of work practices illuminates the causal mechanism of the actors and structures. Just as people do not create the society, that pre-exists them and a necessary condition of their activity (Bhaskar, 1989), the workers are part of the workplace structures, practices and conventions. Their learning moments occur, amidst routine activities, and both their normal and their innovative (to the empirical eye) work contributions, reproduce and transform the structures of the workplace.

In my view, focusing on the constitutive elements of normal work routines broadens our understanding of how the work conventions and practices which individual's reproduce or transform, are integral to the learning process at work, and is seldom analysed in a work situation or vocation practice. In the final analysis I bring this discussion into focus again. At this point I also reinforce the use of qualitative methods of data collection and analysis, in enriching an understanding of vocational practice relating to credentialising skills at work. A positivist approach would have limited use in explaining some significant dimensions of learning and skill enhancement. The common threads emerging from the four stories offer two larger themes that surround the physical workplace: a) Valorization of informal skill and b) Embedded hierarchies. Both of these are discussed in detail below.

## **5.5 Valorising Informal Skills**

There are several visible problems with the usage of the word 'skill'. As I argued in

the literature review at the beginning of this thesis, the definition of skill can be varied, and thus can mean different things to different people. It can be a synonym for expertise or technique on the one hand, and its noun form can mean the outcome of an acquired ability. The plural form as a prefix has been used to denote an activity, like 'skills training'. In other words, skill does not refer to a single 'thing', or an attribute; it is largely recognized by the nature of its deployment. In that sense, 'skill' is also a verb.

In the workplace, where exceptional skills can be acquired in an arbitrary way, springing from neither a conditioned existence nor a planned need, the cases of Sripati or Anandan point to a secular character of knowledge gained amidst workplace dynamics. One could argue there is an element of chance in the way one person gets such an opportunity. Whilst that could be true, there are conditions that intersect to ensure the emergence of expertise in an unplanned, almost random manner. From my fieldwork I question this randomness and embark on an attempt to identify conditions that might nurture a better probability for skill acquisition by learners. In his arguments for legitimizing workplace-born skills, Billett (2005, p.946) seeks "just arrangements" for those workers who learn at the workplace, and who do not stand a chance in competing with credentialised qualifications in the labour market. Avis (2014) takes this thought into valorizing the practice-led learning, in the larger context of vocational education. I make two knowledge claims emphasizing the viewpoints of Stephen Billett and James Avis.

### **5.5.1 Valorisation by Recognition**

The recognition that comes from the ability to keep the production lines running is an emergent property of the individual ability of Sripati. His outputs; those observed at an empirical level in the form of troubleshooting is not valued by the owner as a skill. What is valued is the wider circumstance of the continuity of the machinery within the control of the production environment that gives value to the technician's skill. The recognition for his skill is partially attributed to the self-fulfilling prophecies

around the “ability” of Sripati to fix any machine, in time. It is his performance of skill, and his ability to unravel complex problems with the machine, that is recognized first. What could be appropriate is to move from definitions to practices or performances that demonstrate skill. However, I argue that in distinguishing the performance from technique, I am showing that it cannot be reduced to the latter. The performance of skill increases as the individual moves through five phases (Dreyfus and Dreyfus, 1986) is discussed in Chapter Six separately.

Valuing skills and processes that assign value to skills challenges the frontier of cognitive frames. This is taking the premise into why someone learns. Labouring here is not exploitative in that sense. The expert worker looks at this as something to be proud of, and not just a means to monetize. This is similar to Sripati feeling good about choosing his trainees, because that recognition itself offers him the incentive to perform to a higher skill level.

Extending the differentiation from the above, there is an element of skill - aside from the descriptive- that bestows a position on its holder, differentiating its possessor from the ‘others’ by evaluation. In this form, it becomes an honorific. Let us look at the possessor of skill not having any recognition or value for the same. S/he is unable to use a skill and exploit the currency derived from it, unless there is external value seen from others- coworkers, an external agency or the owner, in most cases resulting in higher pay or better working conditions including recognition. In other words, “finding means to legitimately and authoritatively recognising skills acquired through work hold the prospect of providing just arrangements for these otherwise disadvantaged workers as well as those requiring recognition throughout their working life” (Billett, 2005, p. 944). At the very least, the skill-holders expect recognition from the superiors that elevates both their individual motivation as well as their social positioning. It changes their habitus. If credentialisation that is not recognized in the workplace is bestowed on a worker, it is likely to be relegated to this category.

### 5.5.2 Valorisation through enhanced meaning of work

Matthew Crawford (1999) underlines the importance of individual agency in an attempt to explain the “meaningfulness of work” in the context of highly skilled technicians in the motorcycle repairs world (pp.7-8). For work relating to crafts, in addition to the contrived metrics, the aesthetic output of the work certifies the skill level and indeed the expertise of the worker. For instance, looking at and feeling a milled part from an apprentice, the foreman is able to judge the competence of the apprentice. The agency defines the future learning structure and the visible competency offers social currency (Crawford, 2009, p.14).

The meaningfulness of work is also directly correlated to how the output of such work is monetized. Aruna Ranganathan (2017) conducted research amongst the artisanal groups of Chennapatna in Southern India to point out how the higher skilled artisans priced their work, to seek identity from the consumer towards their own craft differentiated from the multitude of similar offerings. This differentiation is underlined by Alexandre Kojève, when he observes:

*The man who works recognizes his own product in the world that has actually been transformed by his work: he recognizes himself in it, he sees in it his own human reality, in it he discovers and reveals to others the objective reality of his humanity, or the originally abstract and purely subjective idea he has of himself. (Kojève, 1989: 27)*

I argue that in addition to the definitions associated with skills by illuminating the *performance* within the practice, the very use of skill in the policy terminology is far from politically neutral, and thus prone to privileging some outcomes over others.

## 5.6 Flat but still Hierarchical in Nurturing Institutional Expertise

In the pursuit of making work “comfortable” there evolve processes through iterative collaborations; that is. These evolve over a period of time, offering space to each other. This does not happen easily, as I learnt from asking the question: *how easy was it for you to learn the new process?* The answers were initially seemingly

simple, but when pressed, the stories emerged. The safety story was one such, coming from a secondary participant when the primary participant pointed me to a “strange method” used to first train newcomers on a walking tour and safety before learning the nuances of work (Primary Respondent PR-12). Over a period of time, the work process was modified based on the feedback of the workers in the manual line.

The entire hierarchy is based on a combination of tenure and expertise - a mix of the level of exhibited skill by the worker, and consistency of output. There is a remarkable absence of any qualifications or certifications and any designated “levels” of jobs. The acknowledgement of seniority is like a universal truth, implicit and understood and accepted by all concerned; the owners, the managers, new workers and peers. To an extent I found this to be arbitrary, but when asked the question to both the expert and his team (PR-6), the above criteria seemed to be commonly understood. In many cases, touching the upper arm reflects this hierarchy for men. For women, it is the lower arm or the wrist. I look at this as a rite of passage for the expert.

Maurice et al., (1986) based their research on comparing the German and French apprenticeship systems, and analysed the hierarchies that support workplace training. An essential feature of such training is the establishment, and evolution of the work system around the individuals. Based on my observations, I support the view that the work system and the individual are symbiotic with knowledge flowing from one to the other. Theoretically a firm can organize its work system in two ways: defining jobs according to its own criteria and require workers to adapt or train them to fit the job definition; or take account of the current workers and design jobs around the capabilities of the workers (Maurice et al, 1986, pp. 66-67). I found evidence of both approaches, more so the latter.

The honorific of ‘skilled’ worker, which differentiates an expert from the others, in all the locations studied, in a way defines the hierarchy (Maurice, 1986, pp. 80-261) in the workplace. It also initiates the power relations or strategies that may develop amongst the different categories of actors in the productive system. An essential by-



product of the productive system, are the relations of *cooperation*, that cannot be isolated from the hierarchical relations through which the social relations of production express themselves. Akka (female supervisor) and Annaji (the owner) were titles bestowed with honour and accepted with pride (PR-1).

The valuing of Sripati's expertise is also *manifest into power equations*: power is demonstrated with the autonomy he is accorded, in choosing the agency for his knowledge transfer. In other words, he chooses how and to whom he will transfer his knowledge. His ability to determine who will come to him for apprenticeships and how he exercises his discretion in choosing his apprentices from others who may be interested, can also be interpreted as a source of power that may not be equitable to those who do not benefit from the largesse of learning and eventual recognition. Lave and Wenger (1991), in their work related to the craft-like forms of production in the 'communities of practice' (p. 35), while emphasizing the social relations at work, are silent on the question of power relations that shape learning, and the consequent social constraints and inequalities that might impede areas within the communities of practice (p.36). The conditions of merit are determined by the master craftsman, and possibly counter-balanced by the same social equations that recognize the skill, and oblige the skill-holder to be responsible for selections on the 'merits' of the apprentices – who or who would not meet the criteria of the master's training. In my question to the Primary respondent, on where is the control, he said, the systemic responsibility of ensuring there is expertise rests on Sripati: in other words, the recognition of skill is also an expectation of consistency of performative learning, beyond the first individual, that is institutionalized through the chain of apprentices. Any break on this would make vulnerable the recognition provided to the master craftsman in the first place. I did not test this notion beyond this phase. Sripati's relative independence is construed as his rite of passage to power in the hierarchy of the workplace.

## 5.7 Conclusions

The four vignettes of informal learning reveal the social and cultural processes and practices of 'valuing' skill that goes far beyond acquiring the domain knowledge and ability of the skill. The meaning accorded to output from the skill, and indeed in the work being done, is valorized within the workplace, sans any credentialisation. The valorizing of the non-formal learning we saw in Section 5.5 posits labouring as non-exploitative and limited to a means of monetizing. An expert's freedom to choose and train his apprentices offers his performative abilities to a different paradigm. On the other hand, the 'seekers' of the expertise bestow an honorific of recognition, a currency to the expert from the value seen by the learners. The recognition to the expert (Billett, 2005) and the acknowledgement from the learners are in a constant dialectic to generate a mechanism for knowledge production that ceases to be limited to work as a means of labouring alone. In addition, when there is an aesthetic to the output of the work, not unlike how crafts-persons perceive their work, the output from the effort is clearly placed for premium and so is the skill. A variation of the former, in an automated workplace is the premium placed for "for its absence"; that is the impact of not having the skill like Sripati's in a continuous production-dependent environment. The potential disruptions and the risk mitigations frame the skill into an expert level of significance in the workplace. When the expert recognizes his or her own expertise and "usefulness" to the workplace (Kojève, 1989), it can be argued that the performative aspect of skill is illuminated within the routine practice.

To define the characteristics of knowledge production, one needs to look at its embeddedness that is incomplete without the domain, or the heart of the skill being learnt. The social-societal interactions are essential means to acquire the skill. Interestingly, once it is acquired it has to be validated through the same social-societal fabric. The knowledge in the workplace is enlarged and enriched by its surroundings, from the purposefulness of the work being performed beyond its economics of labour, in a stream that transcends temporal and spatial boundaries. It is constructed from historical and socio-cognitive surroundings, built upon by a

progression of individual experiences, practiced through homogeneity; and strengthened through heterogeneity. In other words, the individual's skill responses are practiced through a repetitive action of doing the same thing over and over again. When a new situation is encountered the familiarity of the past is insinuated into newer, even alien situations, that sharpens the skills in a heterogeneous, or even unfamiliar circumstances. To formalise a vocabulary of skills, in attempting to popularize and then credentialise its taxonomy, the two-foldedness of the domain or technique *know what* has to interlock with the social-societal *know how*.

In the initial stages, recognition of a learner's skill is not visible to herself, as she sees an incremental accumulation of knowledge, experiences and abilities to maneuver newer situations. In other words, there is an almost gradual increase in their day-to-day learnings. On the other hand, the expert trainer sees the learning moments converge into transformative leaps for the apprentice, packaging the incremental learnings into a more complex resultant experience for the learner. The sum of the parts, thus, contributes to a much larger whole.

At this stage, I also question the political neutrality of the terminology of skills. The usage of skill or its variants discussed at the beginning of this section are anything but neutral, and its usage in policy is problematic without a reference framework. Thus, to locate the value of the un-credentialised skill in the discourse of vocational monologics, it is important for us to also relate the process to existing skill models, question how merit is accorded, and interrogate their relevance to disruptions in workplace learning due to technologies. Chapter Six brings the socio-cognitive processes into focus to enable us to examine this aspect of learning in the workplace.

# **CHAPTER SIX**

## **In the Workplace II:**

### **Learning and Work in a Complex Ecosystem**

#### **6.1 Introduction**

In Chapter Five, I drew upon individual experiences to generate a theorised account of how different workers' knowledges and skills in two sites of match production are valued. In this chapter I look at the complex relationships between the worker, their knowledges and skills, and workplace machines, through a series of vignettes. Like in Chapter Five, these vignettes serve as points of entry to exploring and explaining these dynamics and their effects. The data challenges dominant assumptions about learning, literacy, and the machine. These assumptions; that (i) knowledge transfer between the actors is linear, precise and predictable, (ii) workplace learning is cognitive and maximised when mediated by formal literacy; and (iii) automation replaces labour in a zero-sum game, is shown in the case of the matchwork workers, to be problematic. Instead, the data reveals multiple learning trajectories, literacies, and possibilities for valuing and valorising differentiated forms of expertise, and particularly so as a result of the machine becoming a part of the ecosystem. In the latter part of this chapter these findings are put into conversation with Dreyfus' (1986) model of skill-acquisition. It shows that in these match-making workplaces, work and learning is best conceptualised as part of a complex ecosystem that is, itself, shaped by multiple dynamics - technological, social, temporal, cultural and political - all of which impinge on matching-making knowledge, match production and the circulation of match-making knowledge and skills. Taken together, these insights raise important questions as to what knowledges and skills might be easily codified and scaled. It suggests that a learning demeanor (or learning

to learn), rather than particular learning outcomes might be better as it is also critical to the repertoire of the expert.

Following a similar methodological pattern to the previous chapter, I present four interweaving stories that emerged from my interviews, from video images taken during the study over several visits, and from follow up questions in particular cases so as to illuminate processes of learning. In Chapter Five we saw how the experts prepared the ground for knowledge and skill acquisition of the apprentice. In this chapter I look more closely at the experts, and show that in the context of non-linear and abrupt changes to the manual processes, the workers do see how these are connecting to their livelihoods. The vignettes suggest that knowledge flows backward and forward between the learner and the expert in the workplace, whilst also mediated through machine automation. As the visible presence of machine automation in the workplace increases, some of the workers effectively draw on combinations of cognitive, temporal, social, political and technological understandings to navigate and negotiate their journey to becoming experts, and in particular cases secure their ongoing reputation as masterful experts of machines. In sum, the chapter reveals multiple paths at play – from the ways in which their worth as experts is recognised in the wider social system, to those whose recognised mastery of the machine is secured through ensuring the temporal and social conditions for solving problems involving machines in the workplace.

In the sections that follow, the presentation of most of the vignettes follows a similar pattern. However, there are some places which I signpost in the text which connect emerging themes, or which highlight a particular point that links several of the vignettes together.

#### **Vignette 1: Ravi Mechanic**

**Ravi:** *I prefer the Akiyama to the Heidelberg. Its controls are smoother. I am not saying one is better than the other. It is my comfort, when I talk to the machine (he laughs). No recommendations for any brand- I like all of them.*

Ravi Mechanic is the name by which he is known in the town and nearby areas. The suffix is a title he carries with pride; it is an identity of sorts. Nobody refers to him in the trade by his first name alone. Printing presses, match making units that use printing technology, and sundry electronics manufacturers, all reach out to Ravi Mechanic for installations, repairs, and even productivity measures in the manufactories. He is barely literate but can read the English alphabet. He has been in the business for over twenty years, having learnt his trade from Sadiq Bhai who was himself self-taught as to *how* to use these particular machines. Sadiq Bhai also did not complete formal middle school education.

The first impression I have of this conversation when we were physically close to the machines on the factory floor is almost bizarre. I notice the control knobs were in Japanese and ask Ravi Mechanic how he understands the machine, and also how was it possible that he could troubleshoot any complication with its operation? The Akiyama (automated machine) that we were standing in front of was at least 12 feet long with an unending maze of manual and electronic controls, and an array of manual and electronic components<sup>35</sup>.

**Ravi:** *The machine is like a puzzle. You have to visualise what you are looking for. Sometimes you don't know what it could be...that is when you study the complaint or the problem in more detail. Play it over in your mind. In case of installation, I rely on the brochure or the handbook. Every diagram is useful for me. I don't touch the machine. When I find a German or Japanese brochure, I have it translated to English. The diagrams and layout plans with the circuit is what I look for. I first understand what the machine is meant to do, and what its first and last steps are. Understanding the controls, and where they are, is the next step. Lastly, the minimum and maximum speed is what I have to keep in mind to understand how much a machine can do. That helps me as I tune the controls.*

He points to the three knobs in the front: all of them have Japanese symbols on them. He points to each and translates the symbols to me. Ravi Mechanic does not know how to read or speak the Japanese language, but he understands the symbols on the control knobs. He has memorised them over the years. Ravi is highly visually literate.

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<sup>35</sup> This instance is called to reinforce my method of talking by walking around, capturing ethnographically, the context of the conversation rather than limiting my analysis to only the answers from the participants

His apprentices who are with him have learnt the knowledge of 'limited' translation from him. When they are with him, he continues to talk and repeat what he is observing regarding the working of the machines. They see the problem through his eyes as they learn; they also are learning to be visually literate.

**Researcher:** *How long did it take you to learn?*

**Ravi:** *No machine is the same. Yet all of them have similarities in them. How the machine works, its basic behaviour, my master (Sadiq Bhai) taught me. More than teaching me, I learnt with him. I observed him as he tried to undo each part and what his approach was. At some time, he started asking me my opinion. That is when I began to feel confident...*

**Researcher:** *How much time, (insisting) was this milestone reached in?*

**Ravi:** *I think 2 years - maybe 3. He was very patient. At that time, I had no issue with the job. He sent out many people who did not understand either the complex machines or his way of dealing with them. I think he realised that I was confident about the way I went with the machine.*

**Researcher:** *(Pointing at the assistants) Do you see that in the way you deal with your people?*

**Ravi:** *Yes of course- you ask them.*

He points to Santhana Mariappan. I later sought Mariappan's opinion as a secondary participant for my interviews, asking for his contact and phone number to seek follow-up answers.

**Ravi:** *(he walks around and continues to demonstrate his prowess with the machine) The three key parameters I check are the water levels, speed and RPM.*

**Researcher.** *What do they tell you?*

**Ravi:** *They (pointing at the knobs) tell me, the maintenance characteristics, the upper and lower limits to which I should test the capacity and the energy within the system.*

**Researcher:** *How much of the engineering or theory do you understand for this machine?* (I ask this question considering there is likely to be engineering expertise involved in his answer)

**Ravi:** *I didn't understand this immediately. But I have learnt with the engineers who come to install machines. I see how they assemble some of the parts and how they set the 'thresholds'. These are very expensive machines and when something goes wrong, they cannot bring the engineers to India all the time. So they insist that training be provided to the operators. I join the operators and we learn together on the new machines. Once when we were working on reconstructing an imported machine, it took us three days to understand its working. It was an old model that some new engineers whom we consulted from a different installation were unfamiliar with. The operations were the same but the output was affected in the first trial. The confidence of the customer kept us going; we couldn't let him down. My own fear of failure was in a clash with the positive outlook of the customer. It is important to keep them informed of bad news. There should be no surprises. Humidity controls are new to our climate. This affects the machine. We saw this in printing when the colours can be affected due to humidity. That is why we insist on the air-conditioning to be right, something that no machine brochure will address directly. It is assumed that in a German or Japanese machine, there could be problems if the corrections are not made for Indian conditions.*

I ask about his use of the word 'threshold' in English, as he used the word even in his Tamil response to me). I reflected on this later when I looked at my field notes for the day. What intrigued me was the fact that he not only used the word correctly, but also understood what it meant in the context of the situation he was explaining to me. Clearly he had transcended the two critical elements in his learning: a transliteration of technical knowledge into his 'literacy, and an ability to 'codify' this knowledge sufficiently so as to communicate with his own apprentices. The idea that a particular kind of literacy is fundamental for learning is clearly challenged here in such instances. This knowledge has been produced and transmitted in a form not intended by the designers of the machine. Ravi *Mechanic* had not let his language limitations, or his status as a freelance expert, get in the way of his learning the detail of the new machines. Over a period of time his world of work has expanded to include operators, engineers of new machines, and the machines themselves, and within this world he has developed his own repertoire of what would work and what would not. We could call this world of work an ecosystem involving complex literacies, as well as cognitive and social knowledges, that when understood and interacted with encompasses a set of supportive elements for different workers to be successful at work. In addition to tools, this ecosystem includes resources, such as people, and access to other experts. In the smaller matchwork units, the social



characteristics of the workplace is constituted out of the people and the visible manual process involving a close coordination with their motor skills.

With the automated machine also in this picture, the similarities with the coordination of visual-motor skills continue. There are, however, two major differences. First, there are fewer people within the process producing a much higher output; this is an intended economic objective of automation. Second, coordination takes place within the context of dependencies *outside* of the physical space. The latter is visibly evident in the case of Ravi *Mechanic* and his team, with only some of them in close proximity to the machine. Knowledge exchange takes place between actors physically present and distanced, enabling them to perform tasks related to the machine's installation, its normal functioning, and the frequent events of maintenance.

I have used the concept of an ecosystem in this study to to describe relationships with the others, and possibly their goodwill as well. As a concept the idea of an ecosystem, which originated from ecological studies first popularised by Sir Arthur Tansley (1935), was used to describe physical assemblages in the environment. However as a term it has also been extensively used to represent the complexities of organisational and public systems (Pickett & Cadenasso, 2002; Currie, 2011). From a systems conceptualisation perspective, an ecosystem is “thermodynamically open” (Currie, 2011, p. 22); that is to say, their internal constituents share and exchange matter and energy with their external environment.

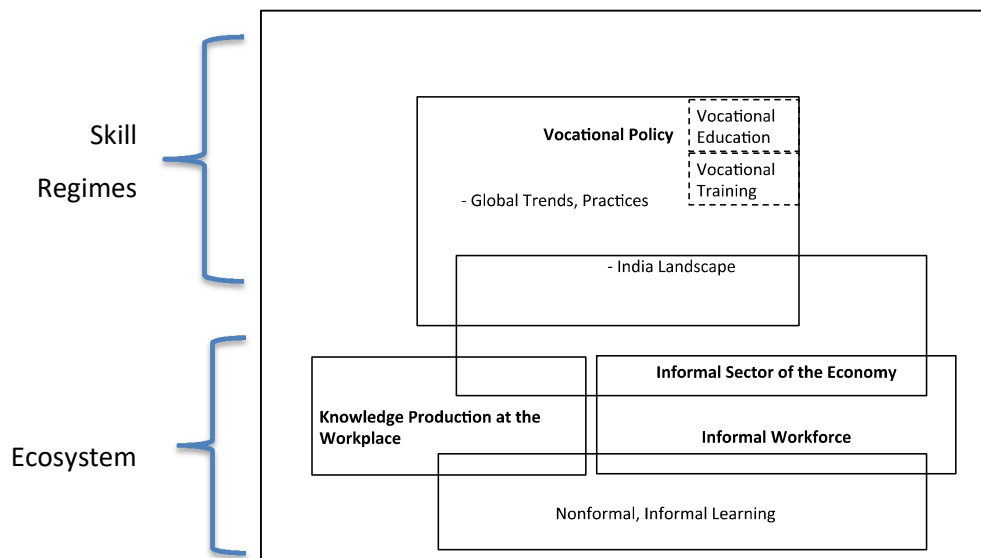


Figure 6.1: Skill Regimes and Ecosystem

Pickett and Cadenasso (2002, p.2) extend the definition of ecosystem to include a degree of multi-dimensionality to the interpretation of the *meaning* of systems, as well as being a *model* and a *metaphor*. In this study I rely on the model and metaphor extensions to the meaning of ecosystems to denote both physical and extended spaces within and beyond the formal boundaries of the matchworks. In vocational policy and practice circles, the idea of the ecosystem denotes the second level below a skills regime that is predominantly political, and is shown in the schematic first referred to in Chapter One (see Figure 6.1).

Ravi *Mechanic's* ability to diagnose the ambient temperatures and humidity, which affect the machine can be interpreted as an expert's ability to apply complex tacit knowledge to newer situations, in turn adding further knowledges and skills to his already complex repertoire. In this case combining existing rules with new experiences, allows the expert to manipulate actions of self and those around towards a desired outcomes with a higher degree of predictability of success. We see similarities of this in the skill model discussed in Section 6.3. Julian Orr (1996) suggests that in a work situation (we might see as similar to that of Ravi *Mechanic's*), where there is a machine malfunction, technicians in 'trouble shooting' mode may associate problems they see with the machine with a causality which is initially indeterminate and eventually leads to a set of known problem fixes (Orr, 1996,

p.123). In other words there is some tentativeness with the technician as the problem is approached. It is at this time that the collective learning *from experiences of the past* is brought to the occasion as a possible solution.

This is a version of what Illeris calls “cumulative learning” (Illeris, 2003, p.171). Illeris explains that in the initial years of life, one learns a new scheme or pattern. This pattern is then recalled when a new situation is encountered much later in life. In the workplace, similar patterns from the individual/s come together, to form cumulative learning. However there is no hard-lined linearity between past learning and new situations; it needs the skills of adaptation to newer situations. The past repertoire of the expert is called upon to enable innovation to take place in a back and forward process of experimenting and negotiating a satisfactory solution in this new work situation and its problem. Learning is the accumulation of (past) experiences but which are also transformed in the encounter with something new (future).

The arrival of a machine disrupts the so far linear **situation→ mechanism→ action** amongst individual actors. The machine becomes a part of the workplace assemblage, drawing from and contributing to the normal functioning of the individuals. The skill of the individual is either replaced or enhanced by some machines. I argue that automation here is not inert addition that replaces workers skills, in a Bravermanian (1974) interpretation of labour power under the conditions of technology driven capitalism, with machine power. Even identities are redrawn if there are correspondences to legacy skills.



Figure 6.2 (a): Mechanised Process

The following two vignettes presented below, first with Ganesan and Chockalingam, and the second with Kanakam are connected. Ganesan, as an owner of his own small unit, does job works for Chockalingam, the owner of several other units. Kanakam is an independent free-lancing worker who does job work for Ganesan and is also his neighbour. The conversation presented below was also added to with observations from my notes and from insights drawn from a video recording of the workplace.

### Vignette 2: Ganesan

**Ganesan:** *I started the unit about 18 years ago. I was a worker in another unit and decided that I can do the chemical mix in a better way. We have grown because I focus on quality of work. I worked with Sunder Annaji in the xxx unit and learnt the basics of match manufacturing. Then I decided to set up my own processing unit. Sunder Annaji supported my decision. He even gave me some money to set up . I did job work for him for many years. Then I also did job work for Chockalingam 'sir' too. We have only manual operation here. My brother and wife are both here. I am the only one who does the chemical mix as that is our formula for good quality. I developed it after several years of trials (I am introduced to his wife and brother, and we have a courtesy conversation. His wife helps him with the match dipping operations- See Appendix- Video of Processes- Gudiyattam).*

Ganesan is sought after for job-work in the match industry. His is a small operation with fast turnaround and predictable supply times, Good quality is associated with his unit. The street on which his house-cum-work-unit is located is adjacent to other smaller home-cum-work-units that perform tray-filling and boxing operations, that

are effectively downstream operations to Ganesan's. In an interesting way, he is an indirect employer to his neighbours. This is in addition to the 8 people who work directly with him.

**Vignette 3: Chockalingam** (speaking at Ganesan's Workplace with the Researcher)

**Chockalingam:** *There was a time when good workers were encouraged by the owners to start off on their own and do job work. With automation, we have other options now. This causes a lot of job-work units to be under pressure to perform. It adds to the problem. So there is one skill that is now going away, even as a new skill (for automation) is coming in. It is but a pressure on him too, as the margins will affect his ability to employ good workers, and train them. Since he (Ganesan) himself does not know the new machines, his expertise on the old process will be limited commercially. He has trained many new workers. We do not have young people who are as skilled as Ganesan. They can only work on one machine.*  
He strikes a match to test its flame.

**Chockalingam:** *A smooth flame without a crackle is good.*

Researcher: *So this means the stick is carborised<sup>36</sup> well and the chemical mix is appropriate for the humidity and the temperature of the place?*  
He nods in assent.

**Chockalingam:** *One of the best in this area. Good price.*

Ganesan (PR- 11) breaks into a smile. His quality check has been done. His acceptance as a skilled producer is reinforced with a senior colleague in the industry endorsing his quality. He believes his quality comes from two reasons: his ability to put good raw materials and chemicals into his proprietary chemical mix; and because he gets a better price due to his recognised skill and output, he is able to attract and train newcomers.

Why does he not mechanize his operations? The first reason is financial. He runs an almost subsistence operation which is efficient for the current size of his business. Any higher investments will have considerable risks for him. He is thus in a sandwiched space without much scope of growth. His training of others is restricted to a small group; and new apprentice joins roughly once per year. This can be

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<sup>36</sup> Treated with chemical to make it flammable but not burn to the far end. A safety feature.

compared to larger units with automation, handling training for about 20-30 new learners every 2-3 months.

**Researcher:** *How long does it take for a new learner to understand and master the old process? Can it be used to train them into a new one?*

**Ganesan:** *The learning time for new apprentices here is about 15 days. It is entirely by observing and imitating the actions of the existing workers (see videos of women worker interviews). Yes, if a new worker understands what leads to good quality, they can adapt to the new process. It is about teaching them the fault areas and build a caution into the work. Just because they are doing a repetitive process all day, does not mean there will be no mistakes. Each step will have its own 'mistake zone'. I tell my workers about one incident when I forgot to add one chemical into the mix, and by the end of the day boxed hundreds of matches. It was not a substandard match by the guidelines. It did not make us happy as good match workers. Pride is important for showing skill.*

The answers here are a corroboration of the first and second phase of the Dreyfus model which I analyse in later in this chapter. However there is no evidence of the learner absorbing "context free" knowledge in the first instance that then evolves to a stage of context-laden learning. On the contrary the in situ nature of learning for Ravi's apprentices as well as Ganesan's transformation, is prominent in the first step of the expertise journey.

The workplace issues in the conversations can be categorised into three kinds: first, the quality of the product that is dependent on individual tacit knowledge; second, the valuing that comes with better quality of product (Ranganathan, 2017); and third, the boundary of literacy for the worker, that also accepts an inevitable shift towards automation. I explain the categories in further detail.

Both Ganesan and Chockalingam exist in a phase of the industry that is not completely automated yet have been on the periphery of the change. Their acknowledgement of the changing needs is balanced by their current work practices, and stands as testimony to challenging external conditions. Ganesan recognised by his tacit knowledge, and his ability to steer his business value proposition via his expertise. In a related but different dimension one can see this similarity with Ravi

Mechanic's learning with Ganesan's own valuing of work, and the social capital drawn from the skill that is sought after, perhaps with a premium. When confronted with the realities of increased automation, Chokalingam and Ganesan's learning does not stop, even as their economic limitations come to the fore. Contrasted with Ravi's adaptation of technology, transforms his formal illiteracy to non-formal literacy, commanding its own premium.

**Vignette 4: Kanakam (PR- 16): (Speaking in the Video)**

**Kanakam:** *I have been doing this for 40 years. I have worked in a match unit long ago, but the for the last several years, I work from here (home is as a neighbour to Ganesan's unit, a larger occupational community that I analyse in the social structures in Chapter Nine). The frame-filling (manual filling of match sticks into a wooden frame, before they are completed by others into boxes), I do about 35-40 frames in a day, working only part-time. I get the work because I have learnt to do it well.*

**Researcher:** *How long did it take you to learn?*

**Kanakam:** *I learnt it myself, watching the others doing it. It is not difficult. It is not like learning a machine (laughs). Her family is very supportive of her work.*

She was very proud of being in the video, and hopes that others see it so that she could show she is not dependent on younger members in the family for survival. Ganesan vouches for her.



Figure 6.2 (b): Kanakam's frame

Even her grandchildren are settled in other occupations, and she doesn't need the money. But she feels that she has to sit on the frames everyday so she feels significant and is demonstrably contributing to the family. For her, work is more than

just a livelihood. She doesn't train people anymore, but many come to her to get family advice due to her age and experience. This is another form of literacy; social emotional, that is converted into a valued skill. Such experience, as in Kanakam's case, is an "expression of the form of learning" (Illeris, 2007, p. 186).

This recognition of being a good worker is common across Ravi *Mechanic*, Ganesan and Kanakam: in other words it is a 'confirmation of worth' (Ranganathan, 2017; Faulkner, 1971) that is drawn from multiple literacies, and workplace as well as wider social knowledge and skills. The humility to accept that they are also dependent on a larger community of learners, even as they become experts, is implicit in their conversations. Learning of this kind is not just what resides in the worker, but what binds the social whole together – from within the workplace and beyond. At the same time, from the point of view of the learner, how they admit a new learner into their conversations as they encounter new situations is, I would suggest, a right of passage. Workplace dependencies are not necessarily dependence on expertise. In the case of Ganesan, he depends on Kanakam for a key job work, but not necessarily to enhance any process within his unit. This situation contrasts with that of Ravi *Mechanic* who seeks his apprentices' views on a problem to be solved.

Kanakam valorises a different kind of learning. Her usefulness in the workplace – her wider social and emotional awareness and experiences show different dimensions of learning that are valued; those that are social and cultural. Her body is like a machine and she is doing what she does long after an economic imperative is exhausted. This more complex vocabulary of literacies, in the case of Kanakam, makes it that much more derives from, but also shapes, her work ecosystem in distinct ways: she contributes to knowledge creation in a way that is unrelated to the direct acquisition of a skill; it is an enabler. This contrasts with the kind of literacy that Ravi *Mechanic* has acquired and which he valorises in a distinctly different way.



## 6.2 Value and Worth in the Context of Machines

Would Kanakam's literacy be valorised differently if a machine were to be embedded into her workplace? Would her valuing of work, and the value that others see in her, change? These questions grow in significance if one considers the transition of large swathes of manual operations to automated units of the kind that Ravi Mechanic draws his literacies from. When a machine is embedded in a workplace, I argue, that the machine is shaped by, and shapes, the agent and the wider structural complexities of the ecosystem. When the apprentice learns the process from the expert, the mechanism is the participative memory in the workplace, as well as what emerges from the intersections of spatially and temporally driven exchanges of knowledges in the ecosystem.

Cognitive theories explain an individual's ability to learn (Kolb, 1984) in a collective. The machine of today is not an inert manipulated object. Its capacity to transform an individual's behavior is not to be under-estimated. Yet it also can be seen to work back the other way; Ravi's visual literacy of machines, and his ability to manipulate its power, output and complexity towards a more predictable outcomes (problem solved), engenders not only a new skill, and indeed an identity (at some point a new one) on the worker (also see Chapter Seven). Recognition of Ravi *Mechanic's* skills and his capacity to valorise this recognition (including his own name's extension of *mechanic*), provides him with a unique identity in the value and worth economy of the ecosystem.

How, then, does the individual worker view her/his own worth, when first, the machine is embedded into the process, and second, when s/he takes control of the machine? These are two aspects of automation. Whilst several studies have commented on the former, it is the latter that I focus on in the process of knowledge production. Automation, here, is considered within Lucy Suchman's (1987, p. 66) framework of situatedness of man-machine interactions. Suchman suggests the contours of the intended effects of automation are moderated by the degree of automation acceptance at an individual level. Conceptually, this is at conflict with

Braverman's (1974) tendency to see the worker as an inert object of hegemonic management control. What I have observed in the 'negotiated' understanding of the degree of automation in the matchworks is closer to Burawoy's (1979) proposition of *control through consent*. In the noticeable absence of unions, this process is, to my mind, a very unique arrangement reminiscent of the model proposed by Ackroyd and Thompson (1999), where workers are active recipients of changes in the workplace. They orient their conduct to a symbiotic albeit unequal relationship" (ibid:29).

At the matchworks, the co-existence of manual and automated processes, and the willingness on the part of the workers to adapt to newer learnings, can be seen as a product of unequal, but accepted, relationships. From a Gramscian viewpoint, the changes affecting the individual also occur at a psycho-physical level (Gramsci, 1971, p.312) and can be seen positively by the individual (though not always). It is this kind of an acceptance that makes many of the workers in the matchworks adapt to, and engage with, the introduction of technology and how it might be mastered.

### **6.3 Introducing the 5-Stage Skill Model**

What is the common thread between the stories of Ravi Mechanic, Ganesan and his workers, and Kanakam? In this section I will be arguing that they illuminate both some common patterns of learning in the matchworks, yet at the same time, interesting points of departures. What do these reveal with regard to how we might understand knowledge and skills, literacies and learning, in the informal economy?

Hubert Dreyfus and Stuart Dreyfus (1986) studied the idea of 'acquired expertise' across professions like nursing, sports like chess and the day-to-day tasks like driving a car, to analyse how an individual learns, through their self-explanatory *Mind over Machine* (1986). Based on their studies, which included interviews with a cross section of learners in the above fields, they proposed a skill model, whereby a novice

learner becomes an expert in their respective field (Dreyfus & Dreyfus, 1986, pp.16-51; Dreyfus, 2004) in five stages.

The progression from the first stage of a *novice* to the fifth stage of an expert, is a continuum that starts from a learner recognising the “objective facts and features relevant to the skill” (Dreyfus, 1986, p. 21) and becoming familiar with their outcomes. The learner in the first stage shows a holistic matching of templates to generic rules with some abstraction and is not allowed to process any information through these rules. Dreyfus and Dreyfus highlight this learning to be context free. The initial rules and the familiarisation are set aside or jettisoned as soon as the learner gains some experience, and who then moves to the next stage of being an *advanced beginner*. According to them, it is here that the context begins to draw closer to the individual’s learning, and gets increasingly situational as the learner begins to absorb the ‘sights and sounds’. I share this view, as this phase is key to any further learning. I highlight my point of departure to this model within these two phases, and will return to this point shortly.

The third stage of skill acquisition is based on a logical, almost hierarchical, procedure of decision-making or competence; to choose a set of definitive actions from a vast array of alternatives or information. There is an element of simplification, even as the situational complications for the learner begin to increase. Dreyfus and Dreyfus (1986, p. 25) argue that the learner begins to exhibit some intuition here. It is in this stage that the learner begins to feel responsible for the outcomes arising from the actions. While the first two stages characterise a “detachment” from the outcomes, this stage calls for the learner’s “involvement”. The *competence* phase is equated to what cognitive scientists refer to as “problem solving”.

The fourth stage is one of *proficiency*, or “know-how”; a condition that the learner acquires from coagulating experiences and converting it into a state of “intuition”. The definition for the latter, according to Dreyfus and Dreyfus (ibid) is different from that of “irrational conformity”- a condition used to denote an unconscious or

irrational means by which human beings make decisions. This stage permits the proficient performer to combine her/his experience of the intuitive organisation of tasks, even as s/he analytically applies the subdued but existing rules towards possible outcomes. Manipulating the environment is a visible proposition for the learner at this stage.

The final stage is one of *expertise*, and reflects the competence that has been discussed in the third stage of this model *with* the maturity to process situational demands. Some of the experts' comments may sound prescriptive, or be hard to legitimise (Dreyfus & Dreyfus, 1986, p.34), but that is precisely what the outcome demonstrates; the predictability of their statements before an occurrence. In other words, the expert processes an enormous amount of knowledge and experiences to give an instruction, make a decision or engage in an action towards expected outcomes. The ability to "predict" outcomes is what makes the *expert* stand out to/from his *beginners* or apprentices.

The vignettes above reveal the gradual acquisition of what we call "skill" in its mature stages. Ravi Mechanic, Ganesan and Kanakam are considered as experts after traversing several stages, which are in a way sequential as described by the Dreyfus (1986) model. But in reality, a set of iterative, cyclical and amorphous experiences lead into and feed off each other, ultimately providing a sort of steady state of achievement where not only a particular technical domain or ability is identified with the individual, but also a mastery over the temporal, technological and political situational variables that can lead to predictable outcomes, on the one hand, but at deployed to master those that are also unpredictable.

From the vignettes, I argue that applying the Dreyfus model (1986) is useful to replicate skill in more formal environments but may not be able to answer queries of scale in non-formal vocational environments involving a high degree of tacit knowledge production and transfer. The scalar nature of the learning moments is fashioned by individual experiences that propel an individual from one level of expertise to the next higher.

## 6.4 Departures from the Dreyfus Model

The Dreyfus Model (1986) offers a way to understand how the hierarchy of skills builds up with experiences and relates to specific competencies acquired by the individual at each stage. The vignettes above are broadly identifiable with each of the stages in the skill model, however are still beyond the explanation of the stages of the model. The transformation of an apprentice into an expert with situations that are unpredictable offer contrasts to the predictiveness of the model. To this extent, I argue that model is inadequate in understanding the know-how of non-formal skills. Perhaps in a formal environment, where there is a direct correspondence of competencies to the effort, the model may be more appropriate.

My observations and interviews with the workers show the multiplicity of events that impinge on the apprentice when s/he enters the workplace. There is seldom any linear instruction and s/he is expected to learn by observation. To an extent, the first and second stages of the Dreyfus model have a blurred boundary for learners in the workplace. I qualify the word 'active' for the reason that learning for the apprentice is not static. Introductions, the process, the de-contextualised generalisations that Dreyfus and Dreyfus (1986) talk about, are merged instantly with the familiarisation of the physical workplace. The thick description (Geertz, 1973) of the situation offers a 'fatness' to the complexity of the influences for the learner rather than a 'flatness'.

In the larger work units, there is a formal process; a flow that leads the learner through the various steps of familiarisation- an association that is organisational yet agnostic to the individual expert or the learner. In other words, there is a linearity that is established through an organisational process. In the matchworks and indeed other such firms, the smaller size creates a high level of dependency between the expert and the apprentice; the teacher and the learner. In the smaller units, it is usually the senior-most worker who takes the new entrant through the nuances of the workplace 'dos' and 'don'ts' even as the domain-related learning is deeply contextualised. Drawing on insights from the vignettes, it can be argued that the

boundaries between the first two stages are somewhat blurred, and the transition from one to the other is almost instantaneous.

To elaborate on this further, I use the 'time taken to learn' as a unit through which we might measure phases of skill acquisition. The time taken to learn is the duration taken by the learner to pass through the first phase to the second phase - from *Novice* to the *Advanced Beginner* - where the situational components according to Dreyfus become important. Ravi *Mechanic's* learning narrative, and the vignettes in Chapter Six, suggests that the two phases of skill acquisition are indeed only one, and run concurrently in the learning process. The blurring of the boundary between each stage reflects the 'learning moments' I pointed to the context-ladenness in the initial stages of workplace learning, in the analysis of Vignette 2 (Chapter Six). It could be argued that the learning moments reported are led by chance and experiment, and may not be representative of the experience of 'normal'.

#### **6.4.1 Thematic disagreements with the formal models**

To make visible in our explanations the possible causal mechanisms, I relate the learning process to the outcomes that are ranked high as workplace success factors (PR – 3). My primary respondent, the owner, was emphatic as to what she saw a 'good apprentice' to achieve to become a skilled worker:

**Owner:** *They have to mentally be ready for work. Some people come here to just get a job. They have a picture of how the work is likely to be, and when they see a different situation, particularly when a large machine is installed, many of them are very confused. Some of them are mentally prepared to learn, that is what we are looking for. They can be trained. Savita (PR-14) started off as an ordinary worker in the line, and soon stood out with how she improved the efficiencies. She is tough and understanding at the same time. She uses her understanding with basic maths to help the others understand that it is in their best interests to be efficient. Today she is a trainer (it is a different thing that Savita did not want to do any training using videos, which is the subject of a different but related analysis).*

I have observed Sripati's or Ravi's respect (Chapter Seven & 8 respectively) come from their understanding of the technology. It is not the technical words, but in the workers' minds, the ability to overcome or dominate a machine, that gives skill on Sripati or Ravi.

**Veluchamy** (PR-3)- Second-generation owner: *We feel it is important for the individual to be sensitive to others and also understand the company priorities. Anyone who learns this faster, is able to stand apart from others.*

Here I will expand on these statements and the observations on the learners, keeping the earlier vignettes and the skill model in the background. The opportunity from automation to build an identity for women is a revelation and goes against the stereotypical assumption that automation displaces manual work. The perception that many women see their ability to control a machine as a means of asserting their self-respect is a nuance not considered outside the workplace. Secondly, the emphasis of understanding the organisational sensitivities (Marsick & Watkins, 1990; Unwin, Filstead & Fuller, 2004, p.4) through its culture underlines the expert's ability to bring learning and expertise towards predicated outcomes. The expertise is not validated unless it is appropriately utilised within the organisation of the team and the company's realities. In the matchworks, for workers like Ravi Mechanic the learning starts from the time the apprentice steps into the workplace. The sights and sounds of the workplace are an integral part of the learning process.

I see two challenges through the multiple levels of experiences the learner is confronted with and acquires as learning. There are important questions here for us to now consider. First, are there causal mechanisms that allow individuals to learn intuitively, in a context that is otherwise seen as complex and requiring formal knowledge inputs? Second, what supportive conditions, which by themselves are inert to other learners, allow for a transformational, even disruptive, learning process for few individuals like Ravi *Mechanic*, Kanakam or Ganesan, so as to overcome formidable technological and literacy barriers, and reach a high level of expertise?

I explain the prevalent work place situation, and the objectives of knowledge production, reflecting on the many levels within workplace: first, going beyond the *empirical* of visible expertise to the *actual* of action events, to secondly, the real of the causal powers or mechanisms that could elevate a normal workplace into a learning apparatus. The structures and mechanisms that cannot be observed in an empirical way, produce outcomes that are particular to a context. The equation of mechanisms to context generates outcomes that are completely different: in other words the whole is more than the sum of its parts. The ontological argument here is in the description of the ecosystem that makes the mechanisms work, with the different contexts, and their situatedness that generate a different form of outcomes.

#### **6.4.2 Non-linear learning at the workplace**

The Dreyfus skill model assumes a particular linearity and a natural progression, whereas the vignettes reflect a different picture which contradicts the skill model. On one hand, if Kanakam's literacy contrasted with that of Ravi *Mechanic*, on the other hand, the non-linearity of the business model that forces Ganesan to adapt a skill-based outcome, and the contradictions to the deterministic notion of machine (Braverman, 1974) draw the formal model of skills into a deeper conversation.

The vignette of Ravi Mechanic suggests that we might challenge the assumption of learning as a linear process. The vignette revealed it to be iterative, circular and repetitive. In short, it does not follow any predictable process, nor is it determined by formal rules. Its conversation is undefined and only a situational description could enrich the causality of the embedded processes within. Ravi is inside and outside the machine at the same time. As he develops a cognitive non-linear way of learning through 'fiddling' in what appears to be organised trial and error, he also connects the past to the future learning. It is the latter equation that he then replicates with his own apprentices. Marsin and Watkin's (1990) notion of self-directed learning which can be counter-posed to "incidental learning at work" through a "trial and error experimentation" (ibid:8), is brought into the account here. In this case, Ravi



deploys a combination of self-directed learning with methods of experimentation to scaffold his own expertise. He doesn't rush to a quick solution. He creates a "space" around him, setting the conditions - to think, to ponder. He is not only creating a political statement around his skill and his reputation but is also resorting to a meta-cognition of learning to learn. Literacy here is in this moment, political in nature. His skill is, I argue, a learning demeanour rather than the ascent of a hierarchy of skill phases.

#### **6.4.3 Multiple literacies: challenging the monologics of formal learning?**

There are multiple literacies in the vignettes – literacies that are cognitive, political, social and technological. It is not a flat ontology of learning; rather it reveals a 'fatness' of learning; one, that is non-linear and formed out of experiments, failures, and circularities that demonstrate a very different shape of the learnings and therefore the emergence of a complicated skill. The different causal mechanisms, the ways in which the worker learning moments are coming together, a diversity of strategies, different workers having different activations that generate different possibilities, all confront the formal assumptions that skill acquisition can be a linear, gradual and stepped process.

In the absence of a formal structure, how do the smaller places replicate the conditions for this kind of expansive learning that I observed and analysed in the smaller workplaces. Yet what is also evident in the case of Ganesan is the visible economic imperative; the survival of the unit amidst competition due to his work output. A close look at the Vignette 2 also brings in two family members. The invisible element is the patriarchal ideology (Watson, 1980:107) with Ganesan's wife playing a supporting, though central, role in the work-process. In the conversation she took on the mantle of a passive role, but it was evident she could handle the process her husband was doing with relative ease - though not with the level of expertise as Ganesan himself. I noted a mutual acceptance of tasks and expertise in other participants as well. Kanakam in a reversal of roles, in Vignette 4, is an example where her spouse plays a supportive role to her expertise.

The issue of automation, and the implications of what this means for changes to the work processes emerge again. When there is a technological change - a new machine installed, automation of existing processes or a technology to integrate two or more earlier processes - there is need to have expertise to work on the new machines. Even as I report cases that have adapted to the machinery, there are others where clearly the formal qualifications become necessary to understand the engineering are highlighted. In such a case the owners do look for persons with formal qualifications.

## **6.5 Codifying the Tacit Knowledge: Issues of Replicability and Scale**

What do all these issues arising out of the vignettes mean for scalability or informing the policy regimes of possible ways in which the insights can be replicated elsewhere? Similar to the tacit knowledge that was demonstrated by Sripati in Chapter Five, a question arises for Ravi *Mechanic*: how replicable is his knowledge? In other words, can the tacit knowledge and the process of learning be replicated in similar conditions beyond those experienced by the actors, by documenting some or a major part of the knowledge acquisition, application and transfer. Suchman (1987) believes that any knowledge from experience could be documented. Ravi Mechanic partially agrees with this:

**Ravi:** *Yes, it is possible to write down some of the instructions, but as you diagnose the machine, you encounter new situations that require a different approach. You cannot be seeing a paper for all the problems you have seen in the past”, he points at the diagram, “only this will be of use.*

In the video that I took of Kanakam creating the hand frames for the matches, the smoothness and reflex with which she stacks the frames is evident (see Appendix - AV). Ganesan’s experiments with the standard formula for the chemical mix results in an improvisation that gives him a competitive edge, as well as recognition of him as a skilled producer. The processing of both the problem/opportunity and a

potential solution is part of the worker's tacit knowledge, and unique to his or her viewpoint. It resonates with the observations of earlier research experiences involving technicians for whom knowledge relevant to the job of diagnosis could not be precisely defined (Orr, 1996, p.107).

There is a limitation as to how much a manual that is effectively a codified set of practices can be used to deal with an immediate and current problem as it not only remains fixed in time, but it also presumes a level of staticness and generality about places and spaces. In other words, the attempt to codify is limited to a few examples, but not all the experiential learning that is implicit in the emerging solution. Extending Julian Orr's (1996) thought, would there be a possibility of constructing a work manual based on individual experiences of people like Ravi *Mechanic*, Ganesan or Kanakam that could offer a formal manual for the machines or the tasks that they perform? What will, or indeed could, be included in any codification exercise is also contentious, and depends upon who is controlling the codification.

However, some codification *within* the work process is possible enhancing the knowledge transfer from an expert to an apprentice. This is not in a written form, but the learning moments from Ravi Mechanic's experiences of problem-solving in the past. To bring the finer details of how a solution was exploited, the expert in him tells elliptical stories- those that make sense and build on humour- within the workers' cohort, to nourish the participative memories which contributed to the solution (Rainbird, Fuller and Munro, 2004, p.130). One is forced to appreciate that most cases reflect a collective arrival at the solutions that a single person would not be able to arrive at. The stories build the learnings that can be transferred with ease to other participants- apprentices as well as others- in the learning process.

The underlying explanations of the empirically attractive vignettes suggest the construct of a skill model as a continuum of stages; each stage is nuanced with a set of outcomes associated with the individual, drawing from an array of mechanisms. The existing model is not challenged for its validity but the explanations arising from

the research have points of departure in the stages of expertise. If vocationally-relevant objectives are to embrace situated actions, the stages of the skills become explicit for use and discourse, even if they have to vary from one situation to another. The correspondence of a skill model to a particular ecosystem of workplace is one potential starting point.

The Dreyfus Model is useful in creating a taxonomy for skills in the workplace and to an extent allows for linkages to be made in case of credentialising shadow skills. However, the point of departure from an absolute fit of the model is the challenge to the boundaries of the five phases of learning – from novice to the expert. Enablers to the learning process, as an apprentice traverses the phases, are enveloped by a collective participative memory that the individual draws from, and contributes to. In addition, a conducive work ecosystem allows for acceleration of learning for the individual, preservation of knowledge for the working group and an expansive learning platform for the organisation. In a pursuit of scale in vocational policy regimes, and the difficulty of codifying individual expertise journeys within the model, this approach will have its limitations.

## **6.6 Conclusions**

In the introduction to this chapter, I drew attention on three questions that contribute to how the knowledge transfer is non-linear, the mediatory influence of formal literacy, and how skill is valued for the individual in the event of automation. Perusing the questions through a skill model offers some insights into how the learning hierarchy unfolds as an apprentice heads up in the direction of becoming an expert. However, the socio-cognitive nature of workplace learning that is not always mediated by formal literacy has multiplicities that are not always linear. The predictability of a formal learning model focuses on the input-output equations of learning moments to skill outcomes, is noticeably absent in the informal workspaces. Instead, in the vocational practice, we find the particularities of a learning moment reveal the pluralities of learning endeavours: criss-crossing learning trajectories,

non-formal literacies, and possibilities for valuing and valorising expertise as a result of the machine becoming a part of the ecosystem.

The role of automation as a disruption to historically-embedded learning processes at the workplace, as well as an opportunity for the individual to adapt to newer systems of workplace production is in the foreground of the inferences emerging in this chapter. If the conventional one-one learning process at the workplace has a sense of linearity to it, the embedding of an agency of automation- be it a machine or a more complicated set of mechanised operations- expands the workplace to an broader ecosystem; spaces are connected to other spaces, from one workplace to another and one locale to similar others. It challenges the existing social structures in an enclosed workplace, newer experts emerge, and the historical time, that Burawoy (1989) mentions becomes significant when the economics of production heave the learning mechanisms.

With the analysis thus far, I pose a question to myself: if a new machine was to be installed where there was none, or only a set of manual processes, would it create a seismic shift not just in the production but in the social fabric of the workplace? The ecology of automation thus finds place in the narrative of the skill model.

## **CHAPTER SEVEN**

### **In the Workplace III:**

#### **From the Particularity of the Matchworks Ecosystem to the Generality of the Skill Regime**

##### **7.1 Introduction**

In Chapters 5 and 6, I explored a series of vignettes to reveal complex orientations to learning in the match-making workplaces. The vignettes also revealed that an ecosystem of differentiated skills emerged as a consequence of automation that could be valorised as expertise. In both the cases, a diverse ecosystem of valuing of skills was thus highlighted. However, these workers also encountered assumptions about work practices, workplaces as particular kinds of institutions, and gendered relations. In other words, the two chapters point to the 'particularity' of the matchworks ecosystem, and the tensions that are then likely to emerge when faced with more 'general' assumptions about learning and work and how these are related.

If the Chapters 5 and 6 took an inside-out view from the workplace, this chapter now takes an outside-in view of the matchworks ecosystem through the flows – within, between and beyond the workplaces - and policies that would have implications for a wider skill regime if the matchworks were to be brought into this regime. It also explores the frictions and opportunities in the non-formal sector and how these might relate to the wider formal sector. In other words, the vignettes and their analyses illuminate a more complex geometry of the physical workplace via translocal flows of works into the matchworks ecosystem, as well as flows from the ecosystem into and out of specific firms. Such flows challenge understandings of

incremental learning in any one firm, as well as raise issues as to how more distant pools of workers might be understood as resources in the formal vocational capacity building measures. The final section of the chapter reflects on the possibilities that are afforded by local practices to inform skill regime.

The views of the respondents are interpreted with comments that point towards the distinctiveness of the invisible structures that manifest in outcomes, such as identity, culture, and their decisions shaping their journey as a learner in the workplace. An unfurling mosaic of individual stories, anecdotes and opinions begins to reveal the unusual from the usual, the extraordinary from the ordinary, and the empirically explicit from the thematically implicit. In the process, the reader's attention is drawn to the bigger picture of formal systems, and how the existing formal systems in/around the matchworks can contribute to nurturing (i) knowledge production, and (ii) the valuing of work that was discussed in Chapter Five.

## 7.2 (Non) Local networks and skill flows

### Vignette 1: Amin, the “outsider “

**Amin:** *We all come from the same village. I came here first and now there are seventeen of us from the same village in Assam<sup>37</sup>. I came here after my tenth standard. The people are nice. I have learnt to speak Tamil. All the people are supportive when they know that you are working hard. It took me fifteen days to learn the process. I can handle the other three machines on this line. Once you pick up the process, it is easy to learn all the related machinery. I have been teaching my other friends here on this, as well as other machines (he points out to the three other machines on the neighbouring assembly lines, that are clattering at high speed, and can overwhelm an observer for the first time with their multiple operations and noisy patterns). We came here for earning, but are now here by choice. We are treated well.*

(Primary Respondent, PR-12)

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<sup>37</sup> Assam is a state farther in the north-east of the country, and it is not normal to see labour supply so far in the south where the matchworks are located

## Vignette 2: Moumin

**Moumin:** *I came when Amin called us here. Initially we were very worried about settling into the new place. The language is new to us. I studied until the tenth standard and came here during my holidays. I enjoy working in the unit. It took me 2-3 weeks to learn the work. It is interesting. I learnt from Amin and then taught many others. I can only work on the machines. The manual work is much more tougher. The people are good and try to teach me the language. I am learning. Will I stay here long? That depends. Maybe next year, cannot say, I hope to earn some money and maybe go to college later.*

The continuity in stories of Amin and Moumin questions a basic premise that is implicit in many workplace case studies, including my own; that there is a high level of homogeneity of the workforce, and in non-urban areas it is characterized with a degree of similarity in ethnic composition. However, as a result of the migration of labour, groups are often from the same places of origin – but the place of origin is not local (Bremen, 2013). Social networks continue to play a strong role in the development of the firm and at the very least provide a consistent pool of labour. The apparent disruption of this logic of ethnic similarities is witnessed in the new development of migrant labour pools in what was, until more recently, the domain of local populations.

The interactions with Amin and Moumin, as visible ‘outsiders’ to the community networks, are dealt with here in the context of institutional networks in two different ways: (i) the disruption of traditional labour pools, and (ii) the development of newer pools that transcend the traditional definition of occupational communities. The former forces a revisiting of how knowledge transmission is assisted by a common language and culture, whilst the latter suggests the need for a discussion on the transversability of skills across geographic spaces.

By learning the local language, new apprentices like Amin represent the disruption and continuity of the strength of weak ties (Granovetter, 1973). By making an entry into a conventional labour pool, they represent disruption; by encouraging their own distant friends and relatives to come to employment opportunities, in this case in



the matchworks, they represent a continuity of the same model. Amin and Moumin represent what is called migrant labour; those who travel long distances in search of work primarily due to unemployment in their home regions, or economic challenges (and thus necessity-driven movement) as a result of seasonal agricultural occupations. Statistical documentation of this group has always been approximate due to the fluidity of their movements from both ends: home and the occupational workplace (Breman, 2013). However an estimate of NCEUS (2009, p.145) suggests this number in India to be around 30 million.

Theoretically, this new group in the matchworks is testimony to the distancing of the definitions of occupational communities from the region or community with which the labour networks are associated. For the matchworks, the communities associated with the regions of Sivakasi, Virudhunagar and Gudiyattam are Tamil-speaking and restricted to the native state, and even to districts. Having a new labour pool represents the possibility of migrant populations expanding beyond the connections of language and culture traditionally associated with the community. In other words, the occupational community now witnesses a more expansive network of apprentices and learners who potentially could increase the mobility of the workforce. The mobility is possible in two ways, inbound and outbound. Inbound mobility is for newer groups to come into the ambit of the occupational community. Outbound mobility is related to those apprentices trained in the occupational community to enlarge the skill base, and in doing so, to go beyond their geographic spaces by taking their skills outside the industry. It is a historical disjuncture from a CPE lens.

### **7.3 Skill Flows *Within* the Local Ecosystem**

The vignettes in Chapters 5 and 6 illuminated the learning process of the expert and the knowledge flow from the expert to the apprentices in non-linear and multi-level interactions. The following vignettes interrogate the local ecosystem influences, and

the invisible influences and their mechanisms that are the result of the conjunction of these dynamics, as well as the direct and indirect stakeholders.

### **Vignette 3: Santhi- (Un) common learnings**

**Santhi:** *I have been here for eighteen years. Came here to work with my sister. Matchworks for me has been a part of my life. My parents worked in the units. We did jobwork at home. Even when I was ten or eleven, I could box the matches that my mother brought home. My father explained to me the how the match head was made. I found it fascinating that some powders that were mixed right caused the flames. At the same time, I learnt of the safety measures. Many people lost their lives. My father told us that the new machines helped save lives. Many of his friends believed that they would lose jobs because of machines. He however felt that it increased the safety. I was excited to see the machines that dipped the matches in xxx<sup>38</sup> unit, before I came here. I did the boxing of matches with the knowledge I had from home, after school. I did not continue schooling beyond the seventh standard but I can read English. That is how I can read the instructions on this machine. Annaji (the owner) asked me if I was interested in learning on the machine, when I was assisting the technician in its installation. He asked me a few questions and determined that I would be able to learn. Today I am able to work on the lines that are **manual** and **mechanized**. (Answers in translation, my emphasis on the words she used verbatim in English; emphasis added for explanations)*

In short, Santhi has moved from being a manual worker to an accomplished machine operator. I thematize two aspects of Santhi's conversation. The first is her use of English words similar to what we have seen in Ravi *Mechanic's* narration of his own learning in Chapter Six. Here the words have a transliteration with a universal understanding amongst the vocational practitioners. There is no equivalent word in the local vernacular, in the usage of *installation*, *manual* or *mechanized*. The former two words, however, do have a meaning but in completely different contexts. Installation could mean a sculpture and manual has a correspondence to 'work', not as an antonym to mechanized. In the workplace, all of them are discrete, but have related meanings in the way they have been heard and used by the listening learners; this is an acquired literacy without the intended comprehension of their meanings.

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<sup>38</sup> Identity of the Unit withheld on participant request

The second aspect of her conversation is related to the ethos of the matchworking community and as such is a deep connection with the occupation, and less an affiliation to a particular organization. At an empirical level, loyalty is between the individual and the owner or the organization. However, a much larger reward is her acceptance as a member of the occupational community. The expected relational inference is similar to what Orr (1996, p.76) and Engestrom (2006, p.1786) point out in the community of service technicians where identity is first to the occupational community, and then second is the employer. Santhi's response to automation also brings in the unexpectedness of gender relations through neutrality, which is almost non-existent in other vocational streams with the exception of the garment industry (Cawthorne, 1993; Boud & deBruijne, 1993). The matchwork ethos for Santhi is drawn from personal experiences of learning from the family network, a level of cognitive preparedness, and an orientation to adapt to newer circumstances. The last is demonstrated by Santhi's ability to transcend the barriers imposed by automation. Indeed, to be able to "control" the machine is what gives her validation from the owners. Her skill is aptly recognized in the workplace, and indeed in her occupational community.



Figure 7.1a. Workers in closed group



Figure: 7.1 b. Individual worker with filling frames (manual)

The pictures (Fig: 7.1 a and b) show a conventional working set up where the boxing of matches is done manually. This is similar to what Santhi started doing. The automated set up is represented in Figure 7.2, in the box-filling process.



Figure 7.2: An automated Box-filling process

#### **Vignette 4: Ayyappan**

**Ayyappan:** *When I started the second unit, I had to ensure that there was an ability of the workers to be able to handle different jobs easily. I selected people who could be trained on different machines. We tried to hire diplomas<sup>39</sup>, but they don't stay. They want to work in the bigger factories or go to the cities. So, we have to train our own people. Nathan (PR-19) is one such person. He has without much effort learnt the mechanized dipping from the old dipping process. Many of the people who did not like the machines have left. Sunitha is also a good technician now. She can do the manual filling and the automatic box filling (SR -5), one of the few women workers we have. I find that the women are more patient with the process and if they overcome the technical barrier of the machine, they perform very well. They are my brand ambassadors, if we have to bring a new machine into the unit.*

The actors within the match industry are characterized by having dissimilar goals. But the primary ecosystem, or the immediate economic unit, brings them together into a conjoined force to deal with the adversities of external economic forces. When automation enveloped traditional practices, the owners and the workers evolved a model that adapted to, and thus created, a means of coexistence with automation. This outcome – one of restrained automation - made the industry relevant in the international marketplace by embracing high-end printing technology

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<sup>39</sup> The post-secondary vocational qualification in the 10+2 or 10+3 format of formal education

(Figure 7.3), and encouraged a ground-level practice of training willing workers to newer ways of working.



Figure 7.3: High end Printing Process, that replaced manual process of painting the striking surface of the matchboxes

The result was a collective, non-formal agreement. More importantly, this agreement was not induced by any form of formal labour collective, like a union, but was an agreement to modify traditional ways of working. As a result those match units that successfully implemented a mix of automation with manual labour, oftentimes using the same human resources, successfully competed at an economic level, and enrolled the support of women who, on the expertise journey, migrate from manual to automation.

The vignettes from the workplaces of Amin, Santhi and Ayyappan demonstrate *know how* (Winch, 2013; Singh, 2015; Hordern, 2016) aspects of skill. *Know how* is acquired as part of the day-to-day learning, as the apprentice workers continue to acquire new skills, or develop approaches to problem solving (Boud and Symes, 2000: 14). Policy, however, and guidelines of credentialisation, veer towards *know what*, or the content and outcomes from work-based learning (Avis, 2004). The experiences of Santhi and Ayyappan are all acquired through being lived and despite their lack of formal credentialisation. Amin's learnability can be attributed to his having completed his high school, but his knowledge acquisition is through the old, established, practices of knowledge sharing that are 'situated and embodied', and inseparable from action, and they are profoundly influenced through social participation (Elmholdt, 2004:327).

From a learner's perspective, the expectations of customers and suppliers, as well as other multi-level stakeholders, drives continuous learning for the individual (Desjardins, Lans and Ederer, 2016: 142). In other words, Ayyappan's testimony of how some people adapt faster is implicit with his own support for such learning. I expand this notion into an idea of expansive learning in an organization, with actors like Santhi on the receiving side, and Ayyappan representing the organization's supporting system, and where access to information using physical and other networks assists the individual's ability to conduct problem solving (OECD, 2012, p.47).

I interpret the vignettes as signposts of not only what someone knows, but also how the apprentice learns. Around this, I explore the institutional mechanisms that define and redefine the physical and extended spaces of the occupational community that both determines the possibilities for learning, as well as assists with such learning. The evolving value of work speaks to, and shapes, the social contract of employment, and whether or not changes in the workplace affect or are affected by the formalities of paid work and thus what their implications might be for learning (Rainbird, Munro & Holly, 2004).

#### **7.4 Repurposing the 'Employment for Learning' Contract**

It is important at this point in the thesis to now locate these vignettes inside the wider 'employment for learning' contract. This means moving outward to explore the conditions under which learning takes place, especially where there are no contractual obligations of the work. Two moments are of interest; the first moment when the apprentices pace the skill stages (Dreyfus, 1986), and a second moment when the increased complexity of automation and ecosystem outside of the immediate physical workplace influences the employment for learning contract. It is one thing for the individual to have crossed over from manual to automation, as discussed in Chapter Six. But the wider skill regime – with its tendency to generality

rather than particularity - has no real means to either acknowledge, or recognize, these new skills as learning. Within the formal credential system, the two jobs in manual and automation streams are treated as two distinct career pathways (Section 7.4.1). The study finds this to be problematic, as in reality the same individual traverses two different realms of expertise, with new knowledges emerging during the transition itself that has no means of being valued or credentialised outside of the workplace.

In looking at this issue through the lens of the employment contract we might ask: are there elements in the contract of employment at the matchworks, implicit or otherwise that enable the unconventional transitions of the kind exposed in the vignettes?

With the valuing of manual skill extending to the automation environments, has there been a change in the nature of work and the corresponding value in the learning for the individual? Edwards (1995, 1998) asks us to consider whether the employment contract is indeed a contract based on an explicit agreement to particular practices, or is it simply the result of habit and custom? He notes:

“A rule is a social institution involving two or more parties that have a basis in law, a written collective agreement, a unilateral decree, or merely an understanding that has *the force of custom*” (p.5).

It is the last idea, that of the force of custom, that seems to define the work agreements and their derivatives in the matchworks. Here we can point to two specific implications of this: the first is what this means for the apprentices and lateral workers and their relations to existing work structures; the second is how non-cash incentivisation through skill recognition plays a major role in keeping the knowledge production. The force of custom that Edwards (1995) emphasizes as a rule of the social institution is visible in the cases of Santhi, as well as Ayyappan. The acceptance of change in the traditional way of working does not emerge as an explicit conflict, even though there seemed to be some initial passive resistance at the beginning when automation is introduced, as one of the owner-respondents (PR-

2) notes. There appears to be a tacit agreement between the owners and the workers on the extent of automation, and whilst the workers are not necessarily involved in the selection of the equipment, they are involved in managing the impact on those manual processes that are replaced with automation. The current trend is less to question job losses but to ascertain the re-trainability of the existing workers. This relates to the primary question raised in the beginning of this thesis regarding policy objectives that implicitly excludes existing workers in the 400 million number (Chapter One: Introduction).

Historically, in the manufacturing industries the works councils or the unions have played the role of mediator, often in explicit conflict with owners and producers on the stated objectives of automation. This is similar to the historical evolution of the match industry itself when the managements of match factories in the United Kingdom were in conflict with (predominantly) women workers in the 1860s to the early 1900s (Satre, 1982). For example, after a series of big and small bitter strikes between the years 1888-1900, the management of Bryant & May - one of the largest manufactories of matches in the Bow area of East London - scaled down its automation plan in 1902, agreeing to worker concurrence on change in processes. This trend has not been evident in the match factories of India.

#### **7.4.1 Formal consultative mechanisms versus organic evolving structures**

One of the first observations to make regarding what differentiates the match industry from other industries is that there is an absence of any collective employee consultation mechanism or unions. Historically, most match units in India emerged as 'cottage industries', otherwise identified as commercial establishments closely connected with the home of the owner or worker. Most of the cottage establishments took a secondary place in the matchmaking sector, playing the role of suppliers or job-work units to the larger manufacturers, primarily due to the inability of the owners to market their own produce. Ganesan's home unit (Chapter Six) is one such example. Even as large units became popular as a result of



automation, the coexistence of small units with the larger ones continued to make up the fabric of the matchwork industry. This situation was not dissimilar to what other researchers in the informal sector have reported (Boud and deBruijne, 1993). This aspect, both affecting the industry and its workings, and from the perspective of this research and its methodology, has been discussed in Chapter Three in detail. With the absence of any organized representation, more organic forms of people engagement and evolution of 'standards' of wage and incentive has emerged. This close occupational community has created its own *mycorrhizae* (Engestrom, 2006, p.1787); that is, it is an organic system that has information and other resources being shared in a rather different economy of individual and collective interest protection.

Engestrom borrows this idea of the *mycorrhizae* from the biological concept of the *rhizome* (Deleuze & Guattari, 1987) to reflect the horizontal and multidimensional interdependencies of people in intra- and inter-organisational structures. Surprisingly, both for employers and employees, I found an extraordinary level of standardization of wages or the piece-rates, their terms of employment, and forms of incentives and practices of 'cash advances'. The last is a unique practice where loyalty to the unit and expertise are acknowledged by advances given to the individual to meet expenses, or as soft loans, and deducted in easy instalments from the salary. The contract of employment and its terms are only a symbolic requirement towards this gesture, and it is the social norms that enforce the conditions from both sides: the employer and employee. Within this norm, a 'practice preference' is established towards deciding which worker's request is accepted for a cash advance, and whose is denied, or delayed. The practice preference is a function of tenure, skill position, and the work ethic of the worker. From the recipient's point of view, the monies are no doubt very important. However the value of the acceptance of the request by the owner or manager is an invaluable acknowledgement of their skill and loyalty, and has resonance particularly in the eyes of their peers. I bring up this point here, as cash incentivisation due to credentialisation will have to be evaluated in this context too.

#### 7.4.2 Credentialised Access for Women Workers?

The matter of credentials and credentialising for women workers is addressed, here particularly as the matchwork industry contradicts a more prevalent trend of there being significantly fewer women (to men) workers in skill-related operating environments (Boud, 1993). In such a scenario, assessing the learning contours of the workplace to assess how the workers, in this case predominantly women, might benefit from credentialising is a question pursued through this study.

There is provision for women crafts-persons to be trained in dedicated Women's Industrial Training Institutes (WITIs) as well as dedicated departments in ITIs under the watch of state/provincial governments (Mehrotra et. al., 2014). Could bridging the non-formal with short-term credentialisation work in the context of up skilling women workers? There are specific schemes under the vocational education and training banner for women on the government website (DGET, 2017), and a section dedicated to female training. There are three categories of courses that are 'tailored' for women's skilling and employability, as well as a dedicated department under the directorate with a Director level head for Women's Training. The closest vocational training centre (amongst the 15 RVTI or the Regional Vocational Training Institutes for Women) is in Thiruvananthapuram, some 200 kilometers from the districts of the match units.

The first is a Craftsmen Training Scheme (ignoring the gender labeling for a moment). The only course I could find relevant to automation in the match units is that of *electronics mechanic*; a two-year course (Code EM) with an intake of 32 seats. The essential qualification for this course is a PASS at tenth grade Standard, which would make most women traversing the manual-automation divide ineligible. So, even the first attempt to credentialise *existing* skills comes to naught. A second course is for Craft Instructors with an electronics focus (Code: EM-M) that upgrades instructors through a 4-module input over the duration of 3 months, and in a 2-semester format. For shorter-term courses, a third option is available, and simplified

through certification of the principals of Regional Vocational Training Institute for Women or RVTI. The RVTIs provide regional representation within the vast geographic spread of the country, oftentimes taking the lead in customizing courses to local needs, even though their primary mandate is to take the national policy to the grassroots vocational practice - particularly for women entering the workforce (DGET, 2017: RVTI)<sup>40</sup>. There are 15 dedicated Centres across the country for this. Whilst this is commendable in itself, the intended beneficiaries are not aware of this initiative, as was evident from my respondents (PR-3). It should be noted too that access through the website is not an easy task. Some of the Centres have a more visible presence than the others (DGET, 2017: RVTI)<sup>41</sup>. In this site, representing the regional centre that was closest to the match units, I found there were no modules relating to manufacturing; a category that could immediately assist connecting the women workers' skills to a system of credentials and credentialising. All of the courses are related to soft-crafts, like candle-making, embroidery, and the like, and have a distinct air of stereotyping default vocations to women careers.

If such credentialised courses were to be offered to my research participants, Santhi, Kanakam and others would be lost with such offerings as possible careers. The course (content) or the certifications (credentialisation) would bring no particular additionalities to their current skillset. In other words, there is no motivation, or indeed personal incentive, for the women workers to demonstrate any inclination towards seeking formal qualifications.

### **7.4.3 Knowledge Transfer through Worker's Transversability**

A key question raised in the beginning of this research was whether and how local practices might be generalised so as to shape larger policy objectives, and how transversal a skill regime might be? Transversability is the predictability of a skill that can be replicated from a Situation A to a *similar* Situation B, sometimes by individuating the skill to the task type (Winch, 2013, p.291). Winch (2013), and

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<sup>40</sup> [www.dget.gov.in](http://www.dget.gov.in)

<sup>41</sup> <http://dget.nic.in/content/institute/courses-rvti-thiruvananthapuram.php>

before him Ringberg and Reihlen (2008), underscored the social-cognitive element of knowledge transfers. Jan Breman referred to migrant populations of workers in Gujarat in Western India who came from distant provinces of eastern India as part of traditional migrant networks (pp. 66-67). Would we see similar movements in the matchworks in the future years? Alternatively, an entrepreneur might emerge from this group to expand the skills in their own region. A third possibility is to take the skills of machinery handling into adjacent industries, such as printing, or small-scale manufacturing. The last possibility is the typical definition of transferability now common in current skill discourses (UNESCO, 2015; Winch, 2013:287-88), and is also the closest objective of the skill policy discussed in Chapter One.

Applying the skill acquisition model (Dreyfus & Dreyfus, 1986) discussed in Chapter Six, the non-local traverses the journey from the apprentice stage of economic labour to the expert level, and in the process acquires social capital. Would the social capital that is acquired in the matchworks be very different if they were to take their skills to their own local environs? I should add that all the respondents in this category were male. If indeed the trend were to continue, there is a distinct possibility of the majority female demographic of the workforce undergoing a change over the next few years.

## **7.5 And what of research on local practices for informing skill regimes?**

If the previous section was concerned with how the learning of the matchwork workers can be taken into account in the wider system of skill recognition, it behoves me to ask: what might be learnt from research projects like this regarding skill regime policy? There has been lukewarm acceptance of workplace research to inform policy. This can partially be attributed to the academic positioning of workplace learning in the larger schema of learning itself. As explained in the

literature review section, it is only in recent years that the situatedness of learning perspectives, and participative as well as activity-based notions of learning, have begun to be recognised in the spectrum of formal, non-formal and informal learning (Marsin & Watkins, 1990; Lave & Wenger, 1991; Billett, 2002; Eraut, 2004).

Billett positioned workplace learning as central to an organization, and not as a weak alternative to formal classroom or “real learning” (Marsick and Watkins, 1990). However, until recently, the earlier situated theories (Lave & Wenger, 1991) did not combine the ideas of situated learning with formal curriculum content, the role of individual agency (Billett, 2002) and the structural conditions (Rainbird, Fuller & Munro, 2004). It is this phase; of a broad and interconnected theoretical framework which I seek to use to frame a point of analysis from my observation.

The vocational skills in the matchwork industry, evidenced in the data collected for this research and made visible in vignettes in this chapter as well as Chapters 5 & 6, have survived for decades in the face of competition. This has occurred even as the industry has reinvented itself to stay competitive at the commercial, enterprise level. The skill and competency development systems have remained homegrown, even as technological changes have crept at a steady pace into the work systems. The need to have a formal curriculum of vocational training would help the workforce, not only in adapting to change faster, but also by creating a steady pool of labour enabling expansion at the unit level (PR-1). One of my primary respondents, an owner, bemoaned the lack of adequate skills and any recourse to agency intervention to help build his units’ workforce. This did not come up in other discussions with other respondents. However, there was a common thread; of having a shortage in the supply of labour (PR2, PR3) in both of the locations of study.

This indicated a steady depletion of the labour pool, possibly due to the migration of labour into other attractive industry segments outside of the match works (PR- 3, PR- 8, SR- 2), and the lack of perceived opportunities for the next generation in the limited vocations within the matchworks (SR-2). The last point was evident in the responses of the long-timers, and was strongly supported by many of the

respondents to this study who wanted to bring their children into this line of work. This contrast was evident when some of them were clearly third or fourth generation of match-workers, as well as currently having several members in the family doing jobs in this industry (PR- 13, SR 1, SR-8).

At this juncture, I want to return to the framework from which the research questions were determined, and use the vignettes to signpost a line of inquiry that responds to these questions. The vignettes reveal that through ordinary practical knowledge the principles can relate meaning from work and integrate knowledge across contexts (Hordern, 2014, p.27). The contexts can vary from physical spaces for trans-local actors like Amin, or extend to contrasting yet related work environments, like manual to automation. In any case, the policy implications and the shadow areas of practice confront each other in unintentional yet impactful ways when the policy-decisions shaping the nature of particular skill regimes are constructed in such a way as to *not* enable any recontextualisation in local sites. However, with some expansive learning support, it could be argued that the learning for the individuals can be enabled by the contract of work itself. With formal work being a function of skill regimes, by extension, the intended outcomes of policies can be contributors to a more expansive learning approach within the matchworks ecosystem. In addition, I am proposing that formal frameworks and non-formal mechanisms can coexist without the former replacing the latter, as an unintended consequence of policy regimes pushing unfettered credentialisation. With this in mind, Figure 7.4 reconstructs the flows from the workplace vocational spaces and the frameworks of skill regimes. It also engages the initial conceptualisation of how vocational policy influences workplace learning; and vice versa.

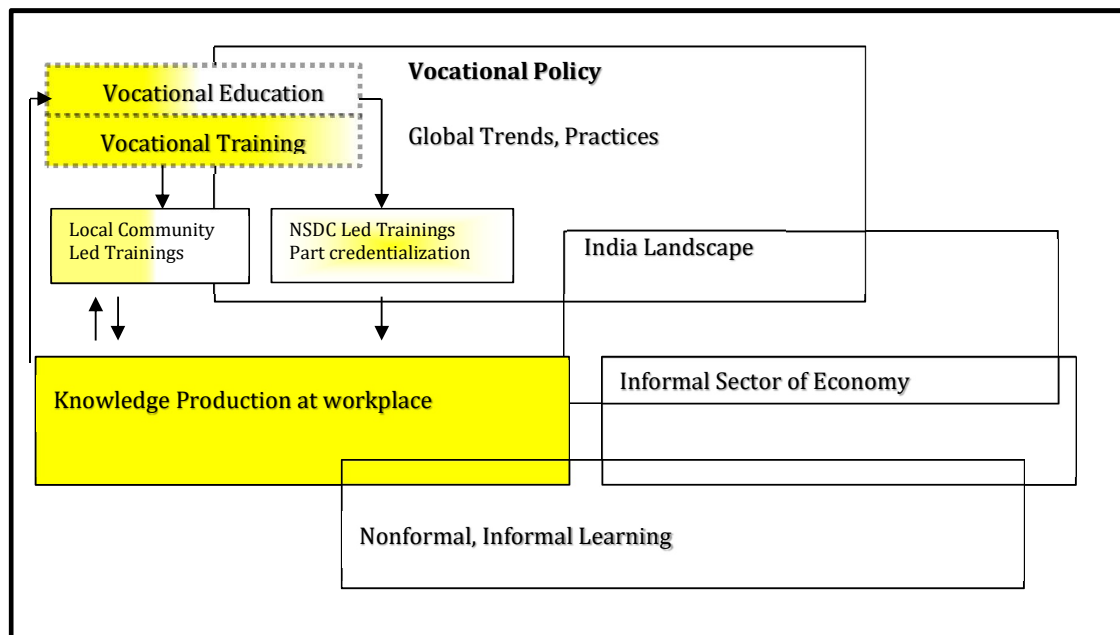


Figure 7.4: Highlighting the potential intersections of policy. The extent of the shading reflects the dependency of the stakeholder groups towards practice impact of Knowledge Production

An example here might help illustrate a viable intersection of policy with the matchworks practice. The Sector Skill Councils (SSC) are a vital component of the skill development ecosystem in India. They are autonomous bodies, but have originated from, or have representation from, industry members related to a particular skill group. These range from Retail Skills, Gem and Jewellery Skills and Manufacturing Skills. The SSCs ensure the training is relevant to industry needs and, at the same time, aligned with the national skill development policy (NSDC,2015). This is done by developing Qualification Packs (QPs) and maintaining them, as per the National Occupational Standards (NOS) under the National Skill Qualification Frameworks (NVQF). This offers credentialisation for the training that leads to employment, and recognition of the training received by the trainees or apprentices. Even though it is largely decontextualised, the SSCs have, in most cases, built the QPs on real situations at work. The training they offer, therefore, is connected to employment opportunities, and credentialisation ensures correspondence to international qualification standards. The curriculum itself is validated by the industry partners of

the specific SSC. The match works unfortunately does not have an alignment with any of the existing skill sectors; the closest relation to the skills from the match works is the chemical industry, but this industry, at the time of writing this, does not currently have a sectoral skill council.

In a situation not dissimilar to the current, non-urban, industrial landscape that the matchworks represents, the model is one of horizontal cooperation rather than a more hierarchical, bureaucratic structure. Patrizio Bianchi (1992) and Giordani (1993) offer evidence of the ‘real services’ or *services reali* leveraging and contributing to the local networks, and Benedetti (1991) comments on the development of apprenticeship plans that tap into local labour supplies, and training them for the local firms. In contrast, a centralized system dilutes local cooperation networks by distancing the benefit from the effort required at the local level. This view was supported in a response from one of my owner-respondents (PR-2), who said:

*“the amount of training I have provided to youngsters was with two points of interest; one for my own firm and the second to ensure there are enough people in the region to support the industry. It has come up in industry meetings on how people are moving to the retail industry, as there is more money there. So we have a responsibility to ensure that people continue to be interested to work here...there is no incentive, no qualification or any other measure that is supported by the government”.*

I took this response to the policy maker asking the question: do you see any possibilities in skill policies encouraging local users to build their own credentialising system, and perhaps incentivize them to do so?

**Policymaker:** *“Our intent is to enable any local unit activity though the sector skill council”* (NSDC, 2015: IR-3).

This was reiterated in a follow up conversation with his successor in 2016 who endorsed the increase in the number of skill councils, which are mandated to recognize sectoral skills and build National Occupational Qualifications (NOQ). One thousand three hundred and eighty six (1386) Qualification Packs, or codified



requirements of skills to particular jobs, correspond to 6,744 unique National Occupational Standards (NOS). The NSDC website claims these have been validated by over 1000 companies (Gol, 2017)<sup>42</sup>. The current policy with the intent of building skills for specific sectors like retail, chemicals and textiles – thirty eight on last count (NSDC, 2017)<sup>43</sup> - seems to have met with some success in the structuring of the industry-related skills. However, what is not clear is the impact on the ground. None of my worker-respondents or policy implementers from the vocational training sector (PR- 21) was aware of any initiatives coming through the system. Neither were the owner-respondents beneficiaries of the new incentives of the policy related to master craftsman and the certification process to be followed (Pilot Data, 2015).

## 7.6 Conclusion

The particularities of the vignettes are analyzed with connections to the skill regimes illuminating the multiple levels of intersections with vocational practice, and engaging the ‘boundaries’ of the workplace. I posit practice-led learning to be a scalar possibility that addresses multiple objectives: social, political, economic, and the individual. The priorities of each category, as also a combination of two or more of these objectives, determine the outcome and the extent to which the ecosystem will exhibit the demeanor necessary for change and the resilience to embrace productive change.

At an individual level, the performative nature of being gainfully employed for a worker is manifested in a contract of employment, and refers to the skill of that individual. Contemporary human capital theories have led to this ‘skill’ being seen as a constant with respect to the job. However, in a changing workplace, the

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<sup>42</sup> Government of India, Ministry of Skills website:  
<http://www.skilldevelopment.gov.in/nationalskilldevelopmentcorporation.html>

<sup>43</sup> [www.nsdcindia.org](http://www.nsdcindia.org) accessed on 23 October 2017. The number of skill councils has reduced from 41 in its peak in 2015/16.

assumption that skill with respect to the outcome of the employment is static is no longer valid, with the varying demand on skill, and the ways in which complex skills are acquired and put to use creates a tension in the contract of employment. To some extent the consequences of redundancies one sees in the shift from manual processes to automation, I would suggest, are due to this. There is some basis in the individual being unable to learn a new skill, or even upgrade her skill to newer work requirements. The vignettes in Chapter Five and, and the appearance of automation in the workplace, seems to be creating such newer work requirements. At the same time, it should be remembered that automation or mechanization does not have the same impact in all situations. The scale of production, applicable to the matchworks industry as to any other, determines the 'possible content of each job not only as the area of direct production, but also in management and control' (Maurice, Sellier & Silvestre, 1986, p. 237).

The vignette of Ganesan (Chapter Six) positions him much too lower on the automation continuum when compared to Ayyappan or Ravi Mechanic (Chapter Six). In other words, despite his high skill in the current way of matchmaking Ganesan or a worker with similar skills, has little or no influence when the current manual processes are mechanized. His skill is diminished in value when he has to start all over again in the new process perhaps with machines that he may or may not master. Ayyappan and Ravi *Mechanic* are holders of contemporary skills in a changed workplace setting. They occupy the other end of the continuum and even define the premium to be paid for their skill. Santhi (Vignette 3) in this chapter, is traversing the journey in between the earlier two worker profiles on the new skill continuum. For each one of them when an external force like mechanization enters the ecosystem, it could be said that their employment contract or the spirit with which the older contract was formed and intended, comes into question. How their work gets defined in the new space and their ability to cope with the learning that is now demanded of the new job – inspite of the output, sans volume, being the same – affects the kind of knowledge assimilation so far in their journey and takes new shape. In other words new competencies are required for the older workers to stay relevant and conform to the newer workplace learning.

Competencies, otherwise defined as the knowledge or the ability to perform a task or a set of tasks consistently over a period of time, vary as a result of the tactical day-to-day activities, and precludes the existence of skills and knowledge for addressing the performance requirements due from the individual (World Bank, 2013). Recognition of desired capability comes from the workplace stakeholders. The owner of the factory (Primary Respondent, PR-01) commented on the “*traditional way of exercising the brain with new machines and processes*”. This aspect, my respondent felt, allowed for the “adaptation” of new skills making the competency of the individual more relevant to the workplace. This reflects the need at a workplace level to create space for indigenous learning methods that are particular to that workplace. However policy tends to operate at a level of generality whose conventions downplay this knowledge and skill in comparison to the knowledge and skills that sit in formal qualifications (Billet, 2005).

The valuing of work, seen in Chapter Five, is expanded to an ecosystem of automation and extended workspaces in Chapter Six, which is further engaged in conversation through the socially embedded know-how. At the same time, the institutional influences bringing in credentialisation are questioned through the vignettes on the grounds of impact and context embodiment. For knowledge production to emerge and thrive, the importance of expansive networks is not only a necessity, but a commercial differentiator, especially when aggregated manual skills can be converted to automation adaptation in the unit.

In Chapter Eight, I expand on the meta themes that have been emerged from the themes ‘In the Workplace’ chapters reporting the ethnographic accounts of the matchworkers: these are; a) valuing work in the workplaces, b) the development/destroying of skills while in adapting automation dynamically, c) a spatial re-definition for workplace and occupational community d) rethinking learning from women’s learning and e) the conundrum of credentialisation, that came in from the vignettes. Using this, I also sieve the comments and the observations from the other participants as well as my own field notes to discuss the

larger themes of this study in Chapter Eight.

### **SECTION THREE**

### **THEMATIC CONCLUSIONS**

*The test of sanity is not the normality of the method but the  
reasonableness of the discovery*

*Bernard Shaw, in the opening of "Saint Joan"*

## **CHAPTER EIGHT**

### **Thematic Conclusions**

#### **8.1 Introduction**

In Chapter One a case was made for the study of the matchworks industry in India and its practices as a means for contributing to the knowledge base on informal learning and vocational training in an emerging economy. This aspiration led me to explore and examine work-based learning approaches in selected matchworks settings in villages in India using both a documentary and rich ethnographic approach. Chapters Five, Six and Seven reveal important differences in both understandings and practices between more top-down ways of seeing work and learning and local practices and their distinct knowledge production and valuing practices. Any move by government to bring this informal sector into the formal economy, and not lose their expertise and the social meaning of work would, I will argue in this Chapter, have to take account of a distinctly different cultural political economy of skill in these informally organized sites.

The overall intent of this chapter is to now pull out the major themes that have emerged in the previous section, and place them into conversation with the wider research findings presented in Chapters Two and Three. The first claim to be made is that vignettes presented in Section Two challenge a series of assumptions, such as that tacit knowledge occurs in homogenous pools, that workplaces are bounded spaces, and so on. In interrogating the socio-cognitive spaces in which non-Locals engage, (i) as learners in a new land and (ii) acceptance as experts and (iii) the transferability to newer spaces of the occupational ecosystem, the vignettes give us important insights with which to also explore improvements in the vocational policy

and practice space, and as a result how wider structures and their institutions might engage with the agency of individual actor (Avis, 2012; Hordern, 2016).

Earlier we met Ravi *Mechanic* (Chapter Six) and Sripati (Chapter Five). Both highlight an important 'skill-based literacy'; one that would need to be included into workplace pedagogies in instances where policy seeks to recognize, acknowledge, and support, expertise in the informal economy rather than viewing it in rather flat ways as un-credentialised and therefore under-developed regarding expertise. Such recognition would have to be at the heart of any strategy that prioritised learning for the knowledge economy. The vignettes interrogate the complexity of human learning in three different dimensions—the cognitive, the emotional and the social. Abstracting the principle of learning from the empirical detail evident in the vignettes illuminates two processes which are on the one hand, discrete moments and practices, but on the other hand are not disconnected practices - internal acquisition process of the learner, the external interaction process between the learner, and the material and social environment (Illeris, 2002, Preface).

The observations of learning moments and interactions with the material and social environment are given life and visibility through an ethnographic inquiry and an attempt to step back from each event. The thematic reflections are framed around six areas of a) valuing work, b) emergence of the non-local spatial, c) issues of automation, d) women's learning, e) extent of credentialisation, and f) forms and implications of routinization. These meaning-laden events themselves are unraveled through possible causal explanations. These are summarized in Table 8.1.

In Chapter Five, deploying an ethnographic approach enabled collating the individual experiences, and giving the learner's voice a context within the ensemble of work practices. Alongside the fact that the workers are part of the workplace structures, practices and conventions, interrogating their learning moments amidst routine activities makes some of their causal mechanisms visible. Valuing of work, illuminated through the individual experiences is called out as an implicit element of

workplace learning, that is further discussed in this chapter. Chapter Six analysed a different, but related set of workplace experiences to differentiate skill levels.

Even as it suggested correspondences to a 5-stage skill model (Dreyfus and Dreyfus, 1986), it brought out questions of disruptions to learning through automation and the role of participative memory in an expansive learning environment. Both of these play an important part in the emerging contexts of workplace leading to further reflections on credentialising skills and linkages to policy regimes.



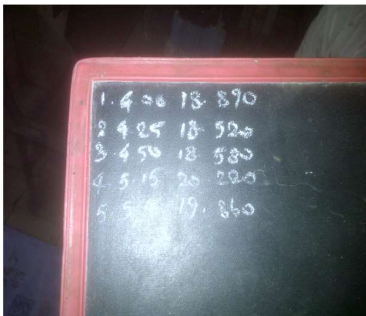

	
<b>Routinised Work</b>	<b>Predictability, Repetitiveness, Efficiency, Automaticity</b>
	
<b>A 'formal' process in the informal workplace</b>	<b>Learning in a physical workspace</b>

Figure 8.1(a): Visualising the Workplace Learning- some examples

These are brought into focus in this chapter. Chapter Seven offers insights from further individual experiences testing the notions of the “local” spatial, and identity in the occupational communities. Social shaping of women identities, as they master



automation platforms amidst contrasting individual-labour intensive learning mechanisms is called out in the context of how/how much do credentialised frameworks assist the practice realities of the workplace.

Understanding before the Study		Inferences after the Study
Historical knowledges sans credentialisation through formal structures	<p style="text-align: center;">←    <b>VERSUS</b>    →</p> <p style="text-align: center;"><b>Using Methodologies (Extended Case);</b></p> <p style="text-align: center;"><b>Methods (Visual, <i>talking by walking around, making the ordinary visible</i>),</b></p> <p style="text-align: center;"><b>Critical Realist Analysis</b></p>	Value of Work: Different ways of valorizing knowledge
Workplace learning is cognitive and maximized when mediated by formal literacies		Valuing of the knowledge, that has formal reciprocity. The sense of autonomy that is different from the autonomy of the workprocess- an ability to use the currency of their skill
Learning is linear, precise and predictable		Cultural, Social, Political elements of learning, even as the workplace exists because of the Economic.
Monologics of Learning/Theories		Multiple literacies in the workplace
Boundedness of <ul style="list-style-type: none"> <li>• Workplaces</li> <li>• Workers</li> </ul>		Extensions/ Boundaryless-ness <ul style="list-style-type: none"> <li>• 'spacing in learning'</li> <li>• Of Workplaces and non-local spatials</li> <li>• Challenging notions to <i>local skills and transversality</i></li> </ul>
Automation as a "zero-sum" game		Automation as <ul style="list-style-type: none"> <li>• an incubator of <i>new</i> skills</li> <li>• an eraser of <i>existing</i> skills</li> </ul>
Visibility= Recognition		Visibility= De-recognition
Possibility of one Skill Model and answers to Credentialisation (where Dreyfus works or doesn't)		Expanded or Modified Skill Model; Possibility of partial-credentialisation.
Decontextualised approach to workplace learning		Learning embedded in <i>Routinisation</i> at the workplace

Table 8.1: Summary of Research Findings

## 8.2 Valuing Work: Valorising Skill beyond Labour?

The skill hierarchy discussed in Chapter Six is only one outcome and does not completely explain the value of work. Moving between worker and the structuring nature of the contexts, we encounter numerous examples of the social and how it is valued in the workplace. These are similar to the *meister* in the German apprentice system, where the valorizing of skill is not restricted to the work environment alone, but embodies forms of social recognition (Maurice, 1986). An example of a very visible form of recognition is the suffix of Ravi Mechanic's name. *Mechanic* is his way of accepting and also demonstrating his skill, and indeed profession. In lesser visible aspects, the expert touches the upper arm of the apprentice; a gentle touch that could both be an acknowledgement of good work on the part of the learner or even an encouragement of a particular set of motor acts that produced good output. Recognition of 'authority' is given to the expert only when a level of 'seniority' or 'expertise' has been reached. This touching of the arm is, I suggest, recognition of skills that cannot be easily codified and credentialised. Yet it cannot be ignored as it is an important means of allocating and reinforcing social values within the workplace. Chapter Five (Section 5.5) discusses at length the valuing and valorizing of skills that lead to the enhanced meaning of work. In doing so, it directly challenges existing definitions of skill (Chapter Two; Section 2.5.2) and current notions of credentialisation.

In another instance, the apprentice calls the senior colleague, "*akka*" – or elder sister (Chapter Five, Vignette 2). The term comes from a family context to a workplace context; yet it should be noted that in its new context, it is a sign of respect and recognition rather than the reflection of a familial relationship. There is no guidance of what to call people by the employer. It evolves over time. For the experienced trainer, teaching the newcomer is initially a responsibility; this then evolves into a particular kind of teacher-pupil relationship (Chapter Five, Vignette-2; PR-4). She connects with the apprentice on matters beyond work, helping the apprentice on tips relating to family, children and the world (Chapter Six, Vignette-4). Camaraderie

develops even as the work expertise increases for the apprentice, without any credentialising in a formal sense. Work gets allocated based on how 'akka' has trained. The terminology of work (e.g. how many boxes will make a *gross*), whilst the broader aspects that Sundari Akka trains on safety (Chapter Five, Vignette-2) becomes enmeshed in the learning process. Observation is key (Chan, 2015) and the practical aspects of improving skill and work processes that Santhi (Chapter Seven, Vignette-3) explains is intertwined with the happenings in the family and relationships. These conversations are sacrosanct to the workplace. Confidentiality is preserved. All this is informal, and without any credentialisation of the skill or the formal oversight of any examination. There are no rules, documents or guidelines to explain this norm. It happens on a daily basis and is respected by the managers and owners. In some form, the work referrals and the overall productivity base itself grows out of the positive impact of these relationships.

On the one hand, *akka* is now a designation for the senior worker. On the other hand, for the apprentice, it is an agency to be accepted into a learning relationship and negotiated for use in the learning process. The meaning of *akka* has transcended a family relationship, embracing a societal context with a completely different interpretation now in the workplace. This is a particular kind of workplace learning. It is also interesting to note how even older workers- mothers and grandmothers- are still suffixed by the term *akka*.

Taking the example above, and reviewing others that were explored in the previous section, *knowledge production* is visualized by me as being a complex set of processes and influences that come together to over a longitudinal set of connected and unconnected experiences (Lam, 2000; Illeris, 2007). Taking the example of how 'akka' is used both in a formal and non-formal sense in the exemplar, we can compare how this situation is different from a formal system of Education and Training. I will come back to this point again in the next section of this chapter.

Keeping an eye on social context of knowledge production, it is imperative to understand the meaning of *creation*, and the *transmission* of those meanings and

the *construction* of meanings that exist in the knowledge production of the collective enterprise. It is the pathway of *emergent* meaning that I am taking, not meaning *creation*. In other words, the meanings are emergent from real, and realized as actual situations; they are not just an abstraction from the observations. Hence, one could argue this to be an epistemologically constructionist view rather than a subjectivist view. This echoes the conclusions drawn from the class-room experiments of Stanley Fish (1990, p.191) where he stresses that objects are not discovered; rather, they are created using interpretive strategies with or within a social context or background (Crotty, 1998, p.41).

A social constructionist view does not classify knowledge claims as true or false, but focuses on the constructions of reality, that are laden with social context and programs of social behavior (Geertz, 1973, p.44), whilst imbued with power (Cruickshank, 2011). I also argue that the social relations are produced by the firm itself, and there are 'social relations that penetrate the firm from outside' (Maurice, 1986, p.66).

Asked another way, we can pose this question: how and in what way do the social relations affect learning and therefore knowledge? In addition to Maurice (1986) who highlights the importance of social relations discussed earlier in this section, more contemporary investigations (Orr, 1996; Lam, 2000) elaborate on the collective social identity of the occupational community as having with their own structure, to include possible informal hierarchies, as well as language and anecdotes. Ravi *Mechanic* and Kamalam (Chapter Six) have to be seen as individuals who are principal agents of learning within a context of social and professional networks (Rutten, 2014). This was raised in Chapter Three (Section 3.3) so as to problematize the transfer of tacit knowledge.

The transfer of tacit knowledge is not the same as codified knowledge. This is due to the socially-laden nature of particular workplaces which define the tutor (expert)-learner (apprentice) relation in socially-mediated ways (Lam, 2014; Polanyi, 1967). Even as they shift between multiple social contexts that in turn extend the

workplace to others and thus widen the nature of the interconnections, their expertise is recognized and accepted. The openness of networks to invest in, and then draw from, the relations around, create a level of effectiveness as these social contexts support learning (Granovetter, 1973). In other words, it is the aspiration of a (collective) identity, which steers the learning journey. In return, all of the processes cycle back towards reinforcing these social relations. This is represented as a cycle and is represented in Figure 8.1 (b).



Figure 8.1(b): The cyclical process of social relations in the workplace

At the same time, the extent of the influence of social relations (Sennett, 1998, p.85) helps distinguish between the skill-domain for the individual from the organizational domain. The organizational domain is an aggregation of individual skills, which are nurtured essentially to sustain the economic survival of the firm or enterprise. I interpret the skill domain (individual knowledge) and the organization domain (collective knowledge) as intersecting processes. It is a knowledge ecosystem with flows of information and learning on a continuous basis, horizontally (by

*cooperation*) and vertically (by *hierarchy*). These, it can be argued, express themselves by the logic of the work system and the organization of the firm (Maurice et al., 1986, p.66). When an apprentice begins the learning journey to becoming an expert, she becomes the link between the collective knowledge and social relations. Would the role of apprentice in serving as an essential link in the transfer of knowledge change with the nature of the organization, and what conclusions may we draw from this?

In a larger enterprise, the formal act of employment is preceded by some degree of perceived fit, such as competence signalled by a qualification, or a simulated test or interview, based on presumed knowledge acquired through formal channels. This is the first step. In the match industry, the hiring process is intrinsically social; it is through referrals (Granovetter, 1973). An existing employee, like Amin (Chapter Seven, Vignette-1) would normally walk in with a friend or neighbor who wants to start work. Often, it would be a family member, or even a parent or sibling, introducing a younger ward like Santhi (Chapter Seven, Vignette-3) for first time employment. The criterion for selection is less 'a qualification', than 'an endorsement' of trust. This trust comes from the existing credibility of the person who does the introduction and now by extension this trust is bestowed on the new individual. Competency is of little consequence at this stage.

Let us take the comparison to the next stage. In a formal organization, an induction of sorts is done where information on the organization is shared with the individual; a stage of 'acclimatisation' for the individuals before they are introduced to the realities of the job. In recent years, the concept of 'buddying' is now an innovation added to the induction process, where a relatively more experienced, 'old timer', hand-holds the 'new-comer' – introducing them to the physical work space and the 'you know what I mean' nature of semi-formal conveying of the organizational norms. The interactions are informal, but the act of 'naming and norming' is itself a formal part of the induction process. This buddying process has existed in manufacturing spaces for several decades (Beaver, 1985), including the historical space of the industrial revolution and the events leading up to the 1888 Matchgirls

Strike situation in Bryant and May, London (Satre, 1982; Arnold, 2011). The physical space in which the employees in the match units work contributes to the acclimatization at work; which indeed is the nursery bed for any training or learning thereafter. Isolating this aspect from the codified practice of job-related learning (in this instance, this learning is equated with skills) results in inadequate representation of the demands of learning the work. We can extend this argument by deploying the ideas offered by the extended case method; that of including a larger ambit of 'extended workspace' that includes participative memory-led learning that has been passed down from the 'past'. Interrogating the participants with a view to co-creating the knowledge claims thus far via the unseen influences and the mechanisms of learning through legacy experience, draws from the insights to critical realism to enable us to see mechanisms in context and their emergences. By legacy experience, I mean the collective (and sometimes selective) set of experiences that a learner has picked up from the past- even distant past- passed on from her tutors and work peers which, in turn, have been passed down from their own peers (Rutten, 2014). Valuing draws well beyond the idea of confirmation of worth, or the idea of "work as a labour of love (Ranganathan, 2017,p.2); it draws on the socio-emotional dimensions which become significant. There is scope for including such recognition for skill development agendas.

### **8.3 Emergence of the *Non-local* Spatial versus Boundedness of the Workspaces**

The boundaries discussed in Chapter Two regarding categories, and in this case female versus male workers, leads me to highlight women, and the tasks they perform in contradistinction to men.

Other boundaries also exist and mark out the nature of the workplace, its connection to other workplaces, to homes and so on. Such boundary recognition highlights more than simply the physical proximity of the work and workers. One boundary is the extent to which work itself is visible in a *normal* routine for an observer. The boundaries are not the object of governing, but they are framed by

the ordering through the social context. Chapters Five, Six and Seven use vignettes to illuminate the localized ordering of what might be seen by outsiders as normal routine workplace functions. In reality, at the workplace and amidst routines, there lie the rites of passage in the journey of the apprentice and their learning, in turn contributing to the workplace body of knowledge. The multi-dimensionality of the workplace is described as an ecosystem in Chapter Six, where the workers' workspaces extend out beyond the physical assemblages - encompassing people as well as resources outside. Do skill models value these resources, and if not, what are the losses for thinking about work-based learning?

In analyzing the cases of Amin and Moumin (Chapter Seven), I address a new dimension of the extended workplace. In Chapter Three, the extended workplace affecting the occupational community is described as the places of work in the vicinity of the physical workplace, and within the village or town. In the case of the non-local workers entering local matchworks enterprises, the transversality of expertise and workplace-led learning raises interesting scenarios of individual skill expanding the knowledge (in this case of the match making) beyond conventional workspaces and work-based social relations of kinship. This suggests arguing for generalizing vocational practices, using empirical studies like this study, to a larger context. If the tacit knowledge of the workplace is only limited to its own context, what wider relations and dynamics go missing and what are the implications of a loss of richness? In other words, is there scope for more *global (skill) geography* (Faulconbridge, 2006)?

Many writers and researchers have written about knowledge in a globalized world flowing through formal and informal networks (Saxenian, 2005; Appadurai, 1996). In recent times, there have been specific references to how tacit knowledge, of the kind produced in the match works, may not be restricted to physical proximity, but rather flows through organizational and trade networks into 'global geographies' (Faulconbridge, 2006, p. 519) of learning. If I accept Faulconbridge's argument in this context, this means; a) stretching the physical spatial to local relational (the exemplar for this is discussed in Kanakam's case of Chapter Six); b) decoupling



cognitive spaces, and c) widening the scope of socially embedded relations. When employees move from one firm to another, or from one location to another as they become the subjects of migratory labour movements, the tacit knowledge that they are associated with is transferred to similar environments, or transformed by the new one. These homogeneous groups within an industry, or with similar skills, can be the agency of knowledge transfer. The use of standard terms is not only because of published technical manuals, but also because of knowledge transferred through the professional groups and social networks of workers. For instance, *gross* as a unit of match or bundles is the same in these Indian villages as it was in the industrial revolution days in England (Beaver, 1985). In a hypothetical situation, if the match trade was to extend to the hometowns of Amin or Moumin, it can be argued that the terminology would in most cases stay the same as the current locations. Now we might interrogate social embeddedness as a concept in a relational space to homogeneous groups outside of the physical workspaces. This may again be encountered in the stories of participants from dissimilar cultural identities but who are immersed in similar work or occupational roles in other vocational streams. The last point raises important issues regarding credentialised low-skill routine work, as well routinization more generally. The second is dealt with as a separate sub-theme in this chapter.

The notion of credentialising skills in the informal sector was first raised in Chapter Two (Section 2.5.2) in the context of how the Indian government has looked to formalize existing skills, whilst at the same time encouraging the formalization of an existing skill acquired through non-formal means at the workplace itself. The relevance of models like the Dreyfus model can help build taxonomy of skills to partially formalize non-formal learning (Chapter Six). However as pointed out in the same chapter (Section 6.5), direct adaptation will be incomplete unless the work ecosystem is included in the making of its stages. In 7.4.2 specific points were discussed in case the gap had to be bridged for women workers who could be credentialised using existing certification frameworks. In summary, with the above considered together, the gaps in policy are not un-surmountable if the inclusion of

practice elements can be considered with some changes to the existing policy structures.

#### **8.4 Automation is not “zero-sum”: when it builds (skill) and destroys (skills)**

In this section I reflect on the use of technology and training videos that one of my participants Santhi vehemently opposed as a tool. And what it means for skills and expertise. If technology as a tool for learning is not being endorsed, where will scalability come from? In other interviews outside of the reported vignettes in the previous chapters, the affinity (or lack of) for technology is indeterminate, with roughly half of the respondents aligning with the changed environment, and the others demonstrative passiveness.

Veluchamy (PR3) and Muneshwari (SR3) (See Appendix: List of Participants) are examples of workers and how technology was resisted. The former equated technology with a consequence of lower income for himself; he suggested that he could move to a more lucrative manual-intensive job if automation was introduced in the current job. Such a view supports the deskilling argument of Braverman (1974). Another respondent in a different match location reiterated Santhi’s view (Muneshwari, SR-3), expressing a preference for learning new skills through a tutor and not any technical aids like videos, citing that it was difficult for her to learn.

Santhi’s ‘familiar’ skill is susceptible in the case of automation as the new technological process can subsume her work. Unless she learns a new skill or transforms her existing skill into its automated form, both her knowledge as well as her employment could be under threat if the match units decide to move to a higher degree of automation. Ravi *Mechanic* and Sripati are two individuals who have crafted their own identities, in addition to securing their livelihoods, through a transitory phase for the match industry. Stepping away from the anecdotes, we ask the question: in such dynamic environments, how can the mandating of automation

at a ground level assist framing a policy approach relating to changing or upgrading skills? Is there scope for a credentialised approach assisting the transition?

At a transaction phase, in the current situation of the matchworks, the practice decisions are completely divorced from any policy impact. There are two connected opportunities here: a) if the policy enables an incentive to be given to workers to learn a new skill, particularly relating to automation, and b) if decentralized to the unit level or a local level makes it administratively easy for the owners as well as the worker (beneficiaries) to seek the incentive. I posed this question to my owner respondents (PRL 1,2), and there was a general agreement that if it benefitted the local labour pool that would support the unit's automation they could consider such an option. From a policy viewpoint, the desired objective of keeping current workforce segments employable is also met to some extent.

The performative nature of being gainfully employed and manifested in a contract of employment is largely centred on the skill of the individual. Contemporary human capital theories have led to this 'skill' being a constant with respect to the job. In a changing workplace, this assumption is no longer valid, as with the varying demands on skill this is dependent on tacit knowledge, in the contract of employment. Partly, the consequences of redundancies are due to this. There is some basis in the individual being unable to learn a new skill or even upgrade her skill to newer work requirements. The Vignettes in Chapter Five and Six, and the appearance of automation in the workplace, seems to be creating such newer work requirements. At an individual level, would the intention to use technology automatically translate to an ability to use technology?

In Chapter Two I identified the areas where the congruence of skill definitions can be contrasted with the variations in interpretation – from broadly its normative usage versus a performative usage. The Arendtian concept of a "conditioned existence" (Arendt, 1998, p.9), as an essential human condition, is framed by the dependence on 'others' and not just the capabilities of the individual. The meaningfulness of

work in particular is epitomized in the process but which ‘disappears into the product’ (p.143). In other words, the relative permanence of the product embodies the process, which includes labour power. The latter, however, is seen as an act or acts of lesser permanence. I argue that individual effort as well as the process, manifest themselves in a clearly recognizable end (ibid 195). For an interpretation of skill, the imagery of the end-product is also its demonstrated expertise (Ranganathan, 2017). Ranganathan uses ‘higher price’ as a manifestation of higher skill in artisans in a South Indian crafts village. In other words, the valorizing of skill has a higher economic value. When automation is embraced, and indeed controlled, as in the case of Ravi *Mechanic* or Santhi, it not only expands the scope for a better end product, but also allows the individuals to place a premium on their own services. In the case of automation, the category of skills that Ravi *Mechanic* represents is different from the category of skills that others are replaced with. In the former, there is mastery over the machine, and in the latter, the machine displaces the human skill in a “zero-sum” game that Braverman (1974) refers to (see also Chapter Three).

At the same time, there is an important conflict here. At what phase of automation would credentialisation become mandatory? In an example from the match processes, whether it is labour intensive or highly automated, the individual performance directly (in the former) or indirectly is characterized in the acceptance of the product, as seen in the case of Ganesan’s quality of work (Chapter Six, Vignette-2). Extending Hannah Arendt’s view to this situation seems to suggest the frailty of human affairs in a work context, similar to a large public domain. Substituting human workings with automation conceals, or even destroys, the very substance of human relationships that are essential for both the product and the process. Whilst stopping short of an extreme view, I position my support to the change in work relationships closer to ‘conceal’ rather than ‘destroy’. From this point of view, I suggest that distancing relations that surround the worker-machine relationship that constantly confront and mediate learning actions may not result in the intended outcomes provided by learning that is codified outside of this field or ‘pushed in’ without considering the complexities and nuances of specific workplaces.

Localizing the impact of the change is likely better nuanced within the ecosystem as it enables the forming and reforming of practices.

In arguing against the 'zero-sum' principle of automation, or automation replacing labour because of how it impacts the value of work, I differentiate the purpose of automation in the workplace. In most instances where economies of scale define the need for automation as "hardware" (Orlikowski, 1991, p.1), or machinery that can multiply the output relative to physical labour, the manual nature of work is *displaced* by automation measures. In other words, the manual work is *enhanced* by the tools and the processes of automation, or the mediation of human action by the machines (ibid: 2).

In the workplaces I studied, I focused on the contrasts of manual versus the automated environments, and how they impacted the individuals. This was a description in the background of each of the interviews with the participants. The new machines, where there has been automation, have clear instructions and formally qualified technicians in place of the earlier skilled workers. The impact is felt on not just the manual processes but also the associated social skills on the shop floor. With the change in technology, there has been a shift in the nature of the skills required to perform the tasks for the output. In many ways, even the tasks have become completely different, obliterating the earlier practices that perhaps needed more human interaction and therefore informed social practices at the work place and vice-versa.

What has the impact of this been, was a question asked in the interviews- and whether this has enhanced or 'magic slated' the earlier practices and therefore made the earlier practices redundant. This, taking the exemplar of the waxing of the heads and the flaming of the wax in the manual match unit L1 (Primary Respondent PRL- 1), which I first visited in 2007; and thereafter in 2015 and 2017. I again saw this in the specialised match unit (L8) that I was unfortunately not able to photograph due to the restriction of using a camera (see field notes on Field Locations L1 and L8). The manual process of deftly managing a wax tray, with a twist of arms, was an

acquired skill: it gave the expert recognition and attracted learners. The social relations here clearly revolved around the skill of the 'flame man' who was sought after as a master craftsman by the young apprentices, clearly awed by the demonstration of his skill. The process, which succumbed to automation, had a very different set of job determinants, eroding the need for any manual skill element (Appendix X- Match Process). My question is this; how do apprentices learn in the new context, where it lacks the attraction of the old job, and the corresponding skill levels are not perceived as different or high (PR-8).

In the interactions with my participants, one of the first questions on automation was to test their initial reactions to the concept. Based on their reaction - of acceptance or resistance - I looked for cues in their examples. Several participants, including those named or referred in this section, expressed extreme degree of comfortableness with the change, or exhibited a marked indifference to the consequence of not adapting to impending change due to automation. I argue that the category of workers who have accepted the automation and mastered it have in a way overcome the Bravermanian consequence of deskilling. Through their responses, when they demonstrate an active engagement with their machines, a common ground has been to develop (a new) skills relating to the machine.

### **8.5 Women's Learning: An Outcome of Expansive Frameworks?**

How can we explain women's learning in the workplace, particularly when it is, for example, mediated-culturally, disrupted by family commitments, or changed as a result of automation? How did the likes of Kanakam, and Santhi reinvent themselves to stay relevant, and indeed create their own identities? Can there be a set of conditions that can create opportunities for more expansive learning (Engestrom, 2001) that in turn fosters the development of competencies for the women workers? Further, is an expansive learning framework possible and scalable enabling non-formal work-based skills in general, and which takes in the needs of women, in particular?

The acquisition of skill in the workplace can be explained by using two related conceptualisations of learning in recent years: legitimate peripheral participation through the situatedness of learning (Lave & Wenger, 1991), and participative memory of occupational groups (Rainbird, Fuller & Munro, 2004). For this sector I intend to dwell on women's networks and the workgroups primarily as they are a large population on the matchworks industry.



Figure 8.2: Occupational Community of Women in the Matchworks

Lave and Wenger studied the process of learning by apprentices in traditional crafts and used what they called situated-learning theory to explain the ways in which apprentices learn in groups of crafts workers by participating in the social practices around themselves. This is an integral part of the learning process that takes apprentices through the journey to be experts or 'old timers' in the field. Their work highlighted a range of ways of learning in settings outside the formal frameworks of educational institutions. They particularly identify workplace learning as a broader form of social learning and what that might mean theoretically and practically. I extend this to women apprentices, placing them in situations like the matchworks, but also to explore communities elsewhere.

This conceptualisation attracted further research (Boud & Garrick, 1999). For example, in an organisational setting Engestrom (1994; 2004) highlighted an activity system in the workplace that engages the learners to produce new patterns of culture. Engestrom called this expansive learning and looked at this through an organisational transformation lens. Knud Ileris (2003), applied expansive learning to

his own explanation of workplace learning theories and provided a definition of *transformative learning* (2003, p.172). Whilst segmenting the kinds of learning, he specially argued that transformative learning was stimulated by a crisis-like situation for the learner that results in the noticeable changes to the original cognitive, emotional and social dimensions leading to the transformation.

Over three-quarters of the participants in my study were women - from tutors to apprentices. The vignettes involving women in Chapters Six and Seven represent a learning environment that encourages these women workers. The willingness of the owner (PR-1) to allow a women worker to transfer into an automated set-up was a visible indicator to how expert-women – often viewed as an exception - can be the new normal in a vocational space with contours to expansive learning.

Fuller and Unwin (2004, p.131) looked at expansive learning using the idea of a work situation and workplace-led situatedness that in turn creates opportunities as opposed to barriers for learning. Here expansive learning is contrasted to restrictive learning, which Engeström sees as a continuum. Simplistic as it sounds, the distinction between an expansive and restrictive nomenclature is the set of activities and the corresponding structures at the workplace that illuminates the practices for the observer. There is no defined set of empirical observations that could definitively classify one workplace as expansive and another as restrictive. I argue that it is the symptomatic assessment, a diagnosis of the learning outcomes, which could provide a more dominant explanation of the prevalent work structure, and therefore an opportunity to produce knowledge. I use an adaptation of Rainbird, Fuller and Munro's (2004, p.130) work to decode the dimensions of expansive learning-restrictive learning in the matchworks.

Before elaborating on the expansive learning framework, as a potentially positive learning apparatus to produce more highly skilled women apprentices, I highlight the responses of PR-14, a respondent who refused to be interviewed in her workplace. She feared her manager who was protective of his enterprise, and would not allow any outside influence on his teams. The ethnographic survey of the workplace (see



Appendix II– List of Locations) assisted me in classifying the unit as a job-work unit. In commercial success terms, it meant playing a secondary role with limited means of expansion or even automation. Even as she was interviewed away from the workplace, my respondent's views on learning were at best lukewarm: *"I go to work because I get flexibility to work, and I need the money. I am happy to do the work, but there is no time to learn anything"*. What happens when there will be machines - will you learn those? She shrugs to tell me that she will look for work elsewhere. To her, learning does not exist beyond being a means of immediate livelihood. As an potential agent of knowledge transfer, she is, in my view a static holder of information, neither adding to or taking from any knowledge repository. She has not accessed, nor is inclined to access, the benefits of any participative memory, largely due to her workplace situation. In the ecosystem of matchworks production and the knowledges that might be creative and created, her immediate work environment has not assisted her beyond ensuring that only her labour has been compensated. This is one of a list of absences, towards an expansive learning framework and is possibly a characteristic of the restrictive learning category plotted on Engestrom's (1994) continuum. Lack of encouragement from the experts, or investments from the owners of the units to acknowledge a process of learning during apprenticeship, impedes a more transformative learning environment. Generalising from such instances, and using Engestrom's continuum whilst adapting it using Fuller and Unwin's model, I suggest that we can compare the more restricted versus expansive approaches towards workplace learning so as to appreciate what is at stake and what is to be gained (see Table 8.1).

This study's approach and findings align with that of earlier researchers (see Boud, 1993), but it goes beyond the view that the learning of women workers is cognitively different from that of men (Belenky, et al., 1986). Women, it is argued learn differently from men in a cognitive sense. It is their ability to adapt - and in a more determined way- when it comes to livelihood alternatives, provided of course that they are in a conducive, supportive environment. In the context of women apprentices, it is less credentialisation that drives an expert to teach an apprentice but that of being a role model; Kanakam (see Chapter Six) is one example. In other

words, inspiration from a talented women worker is an object towards which new female apprentices may gravitate and emulate at work.

<b>Expansive Learning</b>	<b>Restrictive Learning</b>
Association with, and participation in multiple communities of practice, at the workplace and the ecosystem outside	Non-participation and isolation from the larger workplace system
Participative memory-cultural inheritance from the interactions around the workplace, a system of intergenerational relay of stories and anecdotes; what has worked and what hasn't	No accepted tradition of apprenticeship
Dynamic responses to work situation	Static or slow responses to work situations
Some form of organisational recognition to workplace learning, learners and old timers	Lack of acknowledgement to tradition of learning or teaching
Technical Skills valued and valorized	Technical skills taken for granted as a process of manufacturing
Opportunities to learn new skills or job	Rigid specialist roles; connection to short term output from individual work
Managers and supervisors as facilitators of work	Managers role as controllers of workforce
Innovation in work, process is encouraged in some form	Innovation is not called out or acknowledged or propagated

Table 8.2: A comparison of Expansive and Restrictive Learning

Seeking out workspaces that challenge conventional stereotyping of women in the workplace was relatively easier than reports of other researchers (Boud, 1993). Boserup (1970) and Beneria and Sen (1982) talked about the disadvantageous position of women in the wake of economic growth in developmental economies, whilst researchers like Carol Gilligan (1982) explored the psychological constructs of the women at work. In the learning process, whilst it was not the predominant question I was exploring, I chose to study workplaces that had predominantly women. Policy regimes, perhaps inadvertently, begin with the assumption that women are a disadvantaged section of the workplace and build policy from this point of view. The matchworks industry in India has 90% of its workforce as women

(Neilson Study: undated). This research highlights the areas in which women in the workforce can be a business advantage (Cawthorne, 1993). However, evidence as to how they can overcome their stereotyping has not been very forthcoming from this study.

## **8.6 How Much to Credentialise, and How?**

Porpora (2015, pp.88-89), in his press for a reflection on theory, focuses on the need to move beyond empirical data. He suggests stepping back and asking the question: what problem we are trying to solve? This allows us to take on board holistic approaches to addressing the issues. In pursuit of explaining the processes and relations involved in credentialisation in the non-formal arenas of work, I invoked the caution question: how much of the shadow practices must we credentialise for them to sustain their current knowledge production and transfer advantages? Put another way, how much of the shadow areas of practice do we need to make visible, if there are no distinct advantages? Would we lose critical learning practices by excessive formalisation? In other words, even as we attempt to make visible best practice in the workplaces and explore a correspondence with credentialisation, any influence of policy should be limited. It should not disturb in a highly destabilizing way the equilibrium that historically exists in the workplace in certain areas of learning: the unseen hierarchies, the rites of passage of the apprentices, and the learnability of new skills.

The shadows of practice might gain where intersections with the new possibilities are afforded by technology, and as a result of support through policy frameworks. Where they are likely not to gain from policy is when credentialising skills is incentivized but in ways that workers in these shadow workplaces do not recognise. Is it problematic if Sripathi (Chapter Five) or Ravi *Mechanic* (Chapter Six) train qualified engineers in their teams, but also find themselves unrecognized?

With the Vignettes in the Chapter Five, I discussed the limitations of fully credentialising non-formal learning at work (Vignette 3; Section 5.2). Learning is a troublesome term (Unwin, Felstead & Fuller, 2004, p. 1). On one hand it arises out of everyday experiences, and on the other it is seen as a consequence of a deliberate, often formalized, means of pursuing a subject, and the knowledge that is gained through study (OED, 2015, p.316). The latter winds its way into job descriptions and policy discourses, overshadowing the reality that learning can occur outside of classrooms and formal pathways. The Vignettes that illustrated real workers and their real work will not find a place in the credentialised formal employment or certifications. In Chapter Six I discussed what scope there might be for codifying tacit knowledge and what this may mean for policy and the objective of the replicability of skills. The inventory of tools used by the workers, like Sripati (Chapter Five), has to find its way into the National Occupational Standards (Sectoral Skill Councils of NSDC<sup>44</sup>) so as to provide a much needed contextualizing of the nature of informal skill development.

It might also be emphasized that the shadow areas of practice could gain from *some* form of institutional help and credentialisation. Aoki and Dore (1994), based on their research on Japanese firms, have suggested a “community model” whose learning processes do not depend entirely on public policy for enhancing the skills of their employees. This is very similar to what exists in the matchworks. However, this is not to say there is no emerging need for policy support that is neither intrusive to the existing practices nor substituting the historically evolved workplace structures that have enabled adaptation to change. Specifically, the support could be in: a) the incentivisation of indigenously developed skills; and, b) in partial credentialisation of skill valorized in the workplace.

Partial credentialisation appears, in the first instance, a paradox. Why should there be only partial and not full recognition. When the apparent benefits of revealing work processes in turn giving rise to practices was broached to the owners of the

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<sup>44</sup> <https://www.nsdcindia.org/nos>: Accessed 17 January 2018

matchworks units, their openness to educate the workers as well as reskill them was positive. However, there was some resistance to the idea of incentivisation from the employers, as they felt the 'visibility' of the expert to the outside world would diminish the firm's competitive advantage, with the new expertise gaining external currency and therefore enhanced mobility. The incentivisation option emerged in Chapter Five whilst discussing Anandan's (Vignette 4) expectation; of being motivated at work to create learning outcomes through apprentices. The impact of incentivisation has also been discussed in Chapter Seven using Edwards (1995) suggestions of non-cash incentives, but in my view they would likely be more powerful if they were cash-incentives.

A second aspect of credentialisation also emerged: can individual anecdotes or unique workplace elements be turned into recommendations for credentialisation? To an extent, they can within the formalized framework of Qualification Packs relating to the National Occupational Standards discussed above (also referred to QP-NOS), which collect descriptors relating to how a job is performed. The descriptors are generalized versions of such practices but distanced from practice by standardization and presented in English. Including a statement mentioning, say, three stories and two vignettes, could contextually enrich the description of the skill required for the job performance, allowing for a) newer apprentices to appreciate the qualitative aspects of the job, whilst b) similar jobs in other industries might use the descriptors to 'adjust' or modify their own descriptors towards similar outcomes. (Appendix has sample descriptors developed on the basis of this study for a set of QP-NOS).

Further, there is perhaps a direct linkage to credentialisation and their role in policy regimes. When there is technological change – such as a new machine installed to automate existing processes, or technology to integrate two or more earlier processes - there is the need to have expertise to work on the new machines. Even as I report cases of workers who have adapted to the machinery, there are other cases and workers where clearly formal qualifications become necessary to understand the engineering challenges. In such a case, the owners do look for

persons with formal qualifications. As one policy maker responded, the scope of credentialising was limited to the kind of codification that could lead to replicability and scale. However, the issue of who controls this process is as important as who benefits from the codification. This is a key question to be posed so as to address the in-equilibrium of formal qualifications in non-formal sections of the workspaces.

How do the owners see the challenges facing women within the matchworks ecosystem? The owner of a match unit responded by saying that they are open to relooking at their labour supply streams and have also encouraged the local college to enrol more women. This poses questions for the next level of skill enhancement: does formalising a qualification, be an alternative to fostering of learning through the participation in the communities of practice (Fuller and Unwin (2004)? It is here that policy can intervene effectively and for the purposes of equality; by assessing the need for where technological changes are likely to occur in existing places of work and integrating these. The physical work ecosystem (knowing one's co-worker and seeking help in understanding a task) is differentiated from the larger ecosystem that includes the larger social, political and social nuances of the workplace (labour market, supranational priorities, national policy) introduced in Chapter One.

## **8.7 Forms and Implications of *Routinisation***

As discussed in Chapter Three, tacit knowledge is deeply embedded in a workers daily labouring and learning practices. Even as it manifests in demonstrations of skill or application, it has mechanisms underneath that are constantly working to make the skill emergent. We accept that it has to be taken in by the learner, and taught by the owner of the tacit knowledge or experience, and is therefore more difficult to reproduce or transmit. Vocational learning and workplace and work-based learning that is situated draws upon a high degree of tacit knowledge and therefore needs to be sensitive to the those 'daily life' elements embedded in its learning as it passes from one individual to another, and from one related context to another. The first

instance of routinisation was encountered in Chapter Five and explored in Vignette 3.

In a workplace, contextual factors influence the range of actions deployed by the workers in ways that are deemed appropriate within the context (Capelli & Sherer, 1991). In other words, workers perform actions and display behaviours that are seen as suitable to the context. The underlying assumption of learning is also in accordance with routines and processes that are established over a period of time. Ploug and Holm (2013, p. 214) refer to routinisation as an unreflexive and habitual act that can lead to consequences contrary to what was intended in the first place. Reflection is crucial to the formation of plans and values, and reflection links plans and values, reasons and purposes' (ibid). In dealing with activities that are repetitive and every day this might lead to the suspension of reflection. The routinisation of "skilled" can either be an unreflective, habitual act or serve as a springboard for the development of further skills and enhanced knowledge opportunities. The former has to be avoided, and the latter supported.

The conventional thinking for routinisation has been detrimental to individual creativity and organizational innovation. This has, however, been tested through research in recent years where a counter argument; that of efficiency, and sparing use of cognitive resources, is offered (Ohly et al., 2006). Routinisation in the matchworks is the result of separating the conception of the task from the execution of the task, and for Braverman describes historical processes of advanced, if not monopoly, capitalism in the workplace. As pointed out in Chapter Two, technological change through automation has replaced manual work; but for this, there has not been much change in the manufacturing process, or product composition (Beaver, 1985). Observably, the match units all use similar processes with minor variation across the clusters covered in this study. At a work task level, there is a high degree of definition of tasks and outcomes, albeit in an unwritten form. The apprentice therefore learns by mimicking the tutor or the expert (Chan, 2015), and in adhering to the automating of work tasks slips also into routinisation.

How is this routinisation responded to? Work tasks differ on several dimensions, such as their difficulty (comprehension and troubleshooting), urgency, and importance (economically and sequentially within the workflow). Routinised behavior in tasks is likely to result in automaticity in task behaviours, where the match worker is able to perform tasks, initially by observation and later on own cognition, in a repetitive efficient manner. The box filling activities of workers in manual-intensive units (see Appendix X- Matchworks process) also can be seen to operate with a high level of efficiency especially when it involves more experienced workers with a very high level of skill. The same portion of the work process in an automated unit with machines recognizes a different skill in the operation of the machine: repeatedly and with predicted outcomes. The repeated execution of the same tasks in stable contexts (Ohly, et. al., 2017) seeks performance behaviours as responses from the workers. These behaviours are emulated by the apprentices as well.

In the matchworks, routinized tasks or work habits are integral to the performance expected. In a learning context, the external cues - akin to those received from the tutor as well as the competition from the peer group of operators – enhances the repetitiveness of work behaviours. The peer group nurtures both repetitive behavior and course corrections, as an apprentice improvises her own skill by observing several others around her. A variant can be seen in the example of Vignette 2 (Chapter Five) where safety instructions are embedded in routinized tasks. Yet the task as it is related to the workplace is clearly differentiated from the worker's other everyday behaviours (Ohly, et. al., 2006). I suggest that routinisation with the differentiation offers a conceptual framework for workplace learning and training apprentices and needs to be considered in pedagogical methods linked to credentialising experiences.

Would automaticity in the work make it a default process for formalizing learning? Formal learning submits to a notion of “imposed”, whereas informal learning can be placed in the “emergent” category. From observations in the matchworks I can see that, regardless of the category, the process of skill acquisition has to include the



automaticity of task-behaviours, expectations of enhanced performance, and less use of cognitive resources, whilst also offering scope for the individual to innovate. Sripati (Chapter Five) is a case in point; routinisation at a high level allows for innovation that can generate a paradigmatic shift - from the repetitive to the innovative. The emergent category, the informal context in such cases stands testimony to possibilities of justifying routinisation.

## **8.8 Conclusions**

The chapter set out to explore further and extend the six broad themes that emerged from the study. Within the workplace there are social structures and processes that are combinations of ideas, interests, and resources that can be mobilized to transform learning journeys. Valuing of work and workers now takes on a different dimension, far beyond Marx's 'labour value' (Marx, 1899:6). Whilst we see newer entrants in these worksites, we also see that they can be formally non-literate and without credentials but at the same time are valued and valuable. Credentialising informal work rich in informal learning may be a huge task. At the same time, we must ask the question if it is indeed useful to have credentialization replace the valuing of informal work. The theme nudges us to think if there is a possibility to explore partial credentialisation by letting policy frameworks give rise to partners in practice units with selective incentives to encourage experts, but not disrupt their relations of trust. These themes are picked up again in the final concluding chapter, where I return to the research questions and reflect on what policy recommendations might flow from this research in ways that value workers and their work in the informal sector but which also have in mind a productive link to the formal economy and recognition of learning.

## CHAPTER NINE

### Final Conclusions

#### 9.1 Looking Back

I started this thesis with the broad objective of examining work in the informal sector in India and its relationship to vocational education and training within the context of state-governed skill regimes. If skill development is to be considered an economic enabler, particularly as it is in India today, it is important to ask the question of how, and to what extent, this policy is to translate into practice when much of that sector is also organized informally. I began by noting a number of things: first, that data on the sector itself is inadequate in showing the scale and thus the scope of the issues. Second, this kind of data is not able to capture complex knowledge and skills, and if this is so, what does this mean for any skill development regime? Third, that, a formal skills regime assumes a level of literacy as well as makes assumptions about how workplace learning takes place. What are these assumptions, and what does this mean for situationally-located informal work? Finally, I argued that any effective approach to the development of skills will need to bring the world of local practice closer to the policy world at the national and sub-national scales, and vice versa, so as to develop what I called a cultural political economy of skills (CPES).

Given these, my research study was thus framed around three key questions, with the contextual relevance of an informal sector that constituted in excess of 92% of the employable population in India:

*In the absence of formal education, how do newcomers encounter tacit knowledge of Safety Match-making? How do they develop new skills and adapt to new circumstances?*

*What is the relationship between formal models of learning and pedagogy that have been mandated or facilitated by prevalent policy, to the informal*

*models of vocational education?*

*What are the implications of the mismatch between practice and policy?*

How does one operationalize these questions? I proposed and developed a multi-method ethnographic approach that drew inspiration from Burawoy's (1998) *Extended Case Method*. This method enabled me to extend insights into work-based learning as a result of an extensive investigation into different kinds of workers and matchwork firms: to link matchworks production and matchworking across temporal divides; to extend understandings of expertise and its relationship to technological developments; to move beyond bounded understandings of workers and workplaces, and see them as connected, on the one hand to locally-situated social and cultural practices including the home, and on the other hand to skill pools that connect distant places in a dynamic way.

As described in Chapter Four I collected a significant amount of data from, and on, workers and work in the matchworks using an innovative methodology aimed at capturing the complexity of work and learning as a cognitive, social, political, temporal and technologically-mediated process. The purpose here was to widen the sources and thus resources from which to draw insight into processes, so as to enable me to capture the subtle, diverse, and almost hidden-from-view, practices or effects, and from there to posit explanations as to what mechanisms were at work in complex, diverse contexts. I chose to develop vignettes which shaped the direction of the analysis in Chapters Five, Six and Seven, and the thematic discussion in Chapter Eight, so as to enable me to avoid constructing, and thus viewing, labour and learning, workplaces and work, as abstract processes in dislocated spaces. Rather, I wanted to highlight the sights, sounds and smells of the matchworks, as well as the voices, concerns, pride and ambivalences that characterized how these matchworkers understood their skills, their learning, and their passing on of knowledge and skills to newer workers, and so on. That these workers were largely illiterate is important for this analysis, for it challenges policymakers' conceptions of skill frameworks that presume a rather linear learning process, and a literate set of workers to begin with. For sure these dimensions are important. Yet, if the

matchworkers are to be valued for their current skills, and if the economic activity of the matchworks is to be recognized, then broader skill frameworks must be informed in some way by the insights from my study: in short, how not to tip the proverbial baby (informal sector/workplace expertise) out with the bathwater (national skills frameworks). Skills frameworks in the informal sector involving skilled expert workers teaching those entering the workplace must be meaningful, authentic, and relevant in ways that recognize expertise and the socially-situated and cultural nature of work, and not just its cognitive dimensions.

## **9.2 Looking in and on – Key Findings**

The study reports six main findings. First, *the idea of 'skill literacies' offers an alternate perspective on how work is valued*. For example, the learning trajectories of the workers like Sripati (Chapter Five) and Ravi Mechanic (Chapter Six) demonstrate a way of acquiring skills that is dependent on significant amounts of tacit knowledge. Sundari (Chapter Five) teaches her apprentices the 'how' of the work in a holistic sense, coupling the processes of work safety with *aadharam* or livelihood, even as she demonstrates the 'what' of a particular task. These abilities, knowledges and ways of valourising routine work create their own work conventions and practices, and are reproduced and transformed over a period of time. The individuals themselves negotiate recognition amidst a unique ensemble and cultural political economy; of cooperative structures, divisions of labour and social hierarchies of the workplace. Even when the work is technology-based or technology mediated, the workers are able to transcend formal boundaries and master the functional uses of such technologies including the vocabulary used in formal systems (Chapter Seven, Vignette 3). When these 'alternate' literacies confront institutional structures, they often get undermined or unrecognized in the shadows of the dominant formal mechanisms. A conclusion to be drawn here from this insight is that, what is needed are frameworks that ensure the coexistence of multiple literacies with relation to skills and not simply one that dominates and overshadows the others.

*Second, learning was found very typically to be non-linear, challenging linear models of learning.* Workplace learning in informal contexts is deeply embedded in social relations. The findings of this research also point to more circular processes at work in learning. Nor is learning totally dependent on functional literacy. Rather, acquiring expertise can happen even when the worker is not literate. Learning is thus a more fluid, backward and forward, circular process. The literacies of the illiterate workers (Chapter Five) enable them to decipher scientific processes without any knowledge of the science behind it. They are able to valorize this literacy, for example as a valued troubleshooter (Chapter Six) of complicated machinery intended for trained engineers. Elsewhere in the matchworks other workers, without formal qualifications or training (Chapter Six), have built up for themselves, complex tacit knowledges, riding on the force of workplace custom (Chapter Seven). This is at times matched by the employers' subtle repurposing of employment norms nudging learning toward changes from conventional ways of producing matches to technology-mediated means. These set up new learning challenges that move them backward or forward along the learning continuum. Often skilled workers have straddled the entire spectrum of manual work and an ability to handle machines, a cognitive as well as technical dexterity, that results in high quality products by hand that compete with machine-made matches. These demonstrations of varied skills illustrate non-linearity, and the absence of predictability that arises from formal knowledges and training through cognitive means. Yet, their knowledges stem from their situated learnings and not from formal processes. Their situational legibility leads to an intelligibility that is necessary for the economic enterprise they support. Thus, the five-stage Dreyfus skill model (Chapter Six) whilst useful to map the phases in which non-linear expertise is acquired, is also limited in fully explaining how such skills may be acquired.

Third, the view of occupational communities as typically (if not essentially) found within a bounded space of co-located local actors is problematic. This research of the matchworks shows that the occupational community of the matchworks has a trans-local reach. This presents an important challenge to those policymakers advancing

skills frameworks that are geographically and locally specific. To be relevant policy would need to have a wider, trans-local view of the geography of this occupational community. Using the notions of kinship (Granovetter, 1973; Singh, 2001), this study revealed that as much as kinship and identities of community influence the selection of the informal apprentice (Singh, 2001, p.217), the economic realities of business have also conceded traditional workspaces to 'outsiders'. At the same time, the physical boundaries of the workplaces have become more porous so as to articulate with informal spaces at other worksites (for job works) and homes (where workers perform supplementary tasks). This means that the spatial contours of the place of work have been redrawn and the notions of work, with their unique rhythms, relationships, and support systems, are redefined. In other words, these occupational communities are built out of multiple cognitive capacities, and widened social relations, beyond the local, and located, physical workplaces. The spatial extension of the firm's labour pool beyond the local (Chapter Seven) creates new opportunities for the movement of knowledge and may have policy implications of migrating skill labour.

Fourth, this research found that *automation can be an enabler of new kinds of skills and not a negative substitute*. The mostly economic interpretations of the use of automation in the wider literature and reported on in Chapter Three have mostly looked at efficiencies of production by replacing manual labour with machine power. However, this research highlights some rather different dynamics than that which sees automation as a negative force disrupting historically-embedded learning processes at the workplace. Whilst this dynamic was in play, it was also the case that automation created opportunities for some workers to adapt to newer systems of workplace production and in doing so, claim important recognition for their new expertise. The case of Santhi (Chapter Seven), and her trajectory, of moving from a manual worker to an accomplished machine operator, now contributed to giving her an identity as an expert and with it a new place in the social hierarchy. This departs from conventional Bravermanian thinking around automation as always causing deskilling.

Fifth, this research on the matchworks shows women playing a key role as workers in the matchworks industry. The stereotypical view, as to what kind of work can be done by women apprentices, and their own learning, is shown to be problematic. Sundari *akka* (Chapter Five), Kanakam (Chapter Six) and Santhi (Chapter Seven) are role models in the workplaces demonstrating very different abilities; what is common amongst all of them is the notion that they are 'skilled' and accepted as experts who can surpass the expectations set of them as ordinary women workers. An inquiry into each of their trajectories reveals workplace and employment structures, which are expansive rather than restricted in opportunities to learn, in turn feeding into enabling a more generous conception of the possibilities of learning for women. This widens the scope for acquiring and demonstrating their skills through their learning. Kanakam is sought after by younger apprentices for her advice and guidance beyond matters of work. However recognition of her is nevertheless shaped by her contribution to the profession. She represents a category of women who can create their own status economy that in turn generates positive recognition by others (males and females) in the workplace.

Sixth, the research reveals *the matchworks in these South Indian villages to be deeply embedded in the wider social relations of the community and beyond, which also shape what is also valued in the workplace*. Going beyond the community identities that have conventionally marked out the growth of informal workplaces, the possibility of integrating and accelerating knowledge transfer through migrating labour pools is highlighted by the cases in this study. In a way, it supports the social relations impact for cognitive learning; and challenges the limitations so far seen in policy on transfers of traditional learnings outside of homogenous settings. Similarly, understanding the social relations at play in the matchworks in these villages cannot be understood outside the cultural and social specificities of these places, and the ways in which they shape what is valued and how. These two examples highlight the importance of the cultural, in the cultural political economy of skills, as well as the spatial nature of the social as it is mediated by the political and the economic.

So what do these findings mean for recognition of skills and learning in the informal economy, and in the context of emerging skill frameworks. Three particular aspects that could inform formal mechanisms are identified as questions. What are the processes of learning (for apprentices) in the informal workplace that can be credentialised? From the study, the areas of work-processes, safety and an understanding of how the production is done, might be the first entry point. It would formally 'recognise' the rite of passage for the apprentice. This can be done locally, through a self-certification of the owner or the unit. It would enable the least-resistant means for merging the informal with the formal.

Second, and perhaps contrary to the first, how much should we credentialise work and learning in non-formal learning environments? This thesis' findings suggest that authentic and relevant credentialization in the matchworks would need to draw some insight from the ways in work is organized and valued, as well as what might count as recognition. Formal institution-led courses for women workers, such as the example of certification of matchwork skills discussed in Chapter Seven (Section 7.4), would be irrelevant, as the current certification would focus on generic, and thus irrelevant skills.

Thirdly, formal credential processes need to acknowledge that non-automation and automation routinisation does not necessarily mean low level skill or indeed negation and replacement of the workers and their skills. How then might policymakers and skills frameworks deal with this insight in such a way to acknowledge and value such learning and relearning.

From here, we go to the 'so what' of the findings. In sum, the findings show the value of examining the relationship between policy using a practice perspective to reveal gaps or absences in two ways. The first is the absence, if not fuzziness, of historical or contextual information for formal policymaking processes to build on. The second is the inability, inaccessibility, or the unattractiveness for the practitioners, to connect any policy in ways that are immediately beneficial to the practice level. I call the gaps the *shadows of policy* and *shadows of practice*. And



whilst living in the shadows has some of its own benefits, it also has the tendency to make invisible that which can and should be valued through making them visible.

### 9.3 Policy Recommendations

In light of the above findings, in recognition of the emergence of a skills-recognition set of conversations at the national and subnational levels, and calls to close the skills gap in India, and a recognition of the significance of the informal sector as well as its knowledges as part of any knowledge-based economy strategy, the following broad recommendations are proposed:

1. That top-level support is given for a skills framework, but one that moves beyond a flattening out of local practices in ways that they are visible. A framework must be sufficiently flexible so as to purposely look for aspects of work that enrich the local skill. This can be done by examining and recording the local practices into a common database. A framework, based upon a generic and specific set of skills, could be negotiated with different industries and their specifically situated (location/level of automation or not, etc.) firms.
2. Evaluate the need for specific certifications that can be offered, and more importantly administered, at a local or regional level. This is an extension of the sector skill concept that is currently in place, but the recommendation is to *regionalize* its implementation to capture local social and cultural factors.
3. Create, and increase an awareness of women's skills (for example, beyond 'soft skills', like needlework) that are currently offered in the WITIs. A linkage of WITIs to a 'sponsor' organization in each Industry could be a starting point. The matchworks has demonstrated a willingness to partner with ITI framework of the government in areas where there is increased automation.
4. Recognize expert workers using negotiated criteria for consideration of government sponsorship to such formal programmes. This can be an extension of the RPL (Recognition of Prior Learning) effort discussed in Chapter Three (Section 3.6).

5. Incentivise the initial apprenticeship programme in the informal sector: allow for training reimbursements or subsidies to small sector players, like the matchworks, to encourage local apprenticeships.
6. Incentivise any new learning on machines that are used in the workplace for existing workers – for both owners and apprentices - where there are no job-losses due to substitution of labour. This can serve to help retain both manual and machine capabilities.
7. Sponsor research and supplementary studies in the informal spaces that periodically validate the big numbers of policy. As shown in the research, the official statistics and their interpretation are problematic and may impede implementation despite positive policy intentions.
8. Policy level support and investment into a research group like Europe's CEDEFOP as an urgent priority. This Centre would develop a research programme with funds to undertake or commission research so as to build relevant and authentic evidence to inform policy and practice.

## 9.4 Methodological Reflections

Connecting the micro-observations in the workplace to the macro-processes of policy, particularly in the informal sector of the economy as well as the workforce was the big question in my mind as I started this study. Using a construct suggested by Bourdieu (1977; 1990, p.12), I aimed to reproduce the essential features of practice (*opus operatum*) by examining the generative principles of the practice (*modus operandi*). The *modus operandi*, or a way of working, provided an understanding of how the activities take place at the workplace, and how the individual learnt the work as an apprentice. The approaches to observe, collect data, analyse the data, and reflect and abstract from the activities of the individual at the workplace, formed the basis of my methodological choices. A survey would have been limited in capturing the *in situ* observations and reliance on secondary data offered only a *post-facto* view of the event. Thus, the choice of an ethnographic approach which combined visual methods, individual responses through semi-

structured interviews, and study of the artifacts of the production process. The tools of production, accessories to a 'skill', the sights and sounds, informed the complexity of not only the work being done, but how the apprentice went through a socio-cognitive learning journey were all crucial. The epistemic gain from such an approach is the alternative views and the latent inferences. These require a conceptualisation of the correspondence between broader assumptions, structures and/or meanings (Braun & Clarke, 2006, pp.84-85) and practices. A cultural political economy of skills, informed by critical realist ontology, have in my view helped to deliver new insights. In doing so, I recognize that such an approach does not lend itself, and does not intend too, to generalisations. For some that could be a limitation. In my case, this is a limitation I am prepared to live with as a closer articulation of the premise that all social systems are open. Contingency and emergences mean we have a world in motion and one of becoming. This is politically important in that it also holds out the hope of social change and for social transformation of the kinds these recommendations (as mechanism in context) might ultimately deliver for the matchworks industry.

What would have made the study a better one? As I reflect on the methodological choices, the theoretical frameworks and the approaches persist as the right ones. More data, a larger coverage of the industry, perhaps a ethnographically acquired data from different industries would have made a compelling argument to a policy maker: but given the limitations of time and resources for this study, communicating the observations and inferences is limited to the matchworks, highlighting a possible direction for future research.

Another limitation to the study is the issue of language-dependent data collection. In a country like India, where language plays a significant role in the workplace (and society), the linguistic abilities of the researcher can accentuate or limit the collection of data. In my case, I had to rely on the expertise of interpreters, in most cases to be able to draw the right words and context, and to negotiate the right access to information. This has been discussed in the ethical considerations as well.

The ethical considerations in a qualitative approach-led study of this kind were substantial and were kept constantly in mind. My field notes and pictures with comments served as a constant moral compass from my daily interactions during the field trips, and when I stepped away from the field. The tensions with guidelines were largely with consent to be obtained from participants who were illiterate. I had to make choices of which data I would consider or exclude based on consent. Fortunately there were few people who refused consent - either for pictures during the observations or for interviews.

As I reflect on how I accessed the participants, the primary respondents could have been subjected to positional power of two interlocutors (see Appendix- Ethics Note), some of who were also owners. The dependency on owners, who might have some influence on the individual responses, was mitigated by using a third interlocutor, whose credentials as a social worker provided a good set of independent participants.

## **9.5 Originality and Significance and Ongoing Research**

The originality and significance of this research is it brings into view a relatively unstudied sector – the matchworks - using a multi-method ethnography. It concludes that skill frameworks need to take account of these complex cultural political and economic skills as they contribute to what is valued, and to economic productivity. As such, taking account of local, situated practices have important implications for top-down skill frameworks hoping to recognize the informal sector via training and the recognition of skills.

As clarified at the beginning of this thesis, the study was not meant to offer substitutes to current approaches. Rather it was posited as a supplementary mechanism to bring to light approaches that could be added to larger research perspectives that look at macroeconomic modeling for skill development. One could call them, the ‘moment of truth’ checks where such studies could test the efficacy of policy. The methods adopted here offer some evidence towards this possibility.

## 9.6 Final Reflections

I started this journey formally, after joining the research programme at the University of Bristol. In a larger discussion on vocational education and the increasing rhetoric of skills, I brought up the example of the matchworks in a globalized economy and the contradictions in its workspaces. It was the beginning of a series of discussions and meetings with my supervisors on the topic. This thesis is the journey taken from those discussions in the second half of 2015.

My familiarity with the industry, however, went back several years prior to starting the PhD. Perhaps my research journey also took a similar, non-linear path. It was 2007, to be precise. As a human resource professional and a phillumenist, I was attracted to the uniqueness of the matchbox as a product, and the many complicated processes in its manufacture. At the same time, the dominant narrative of the lack of safety practices, and its isolated expertise - even amongst the global match locations- generated a professional interest. I sought out every opportunity to visit some units in Gudiyattam - one of the locations of this study during fieldwork.

At the University of Bristol and during the coursework, I familiarized myself with the theoretical approaches and potential tools that could assist my investigation of broader vocational systems using the matchworks my example. Even as I leaned towards the qualitative approaches, I kept myself abreast of the macro-reports on skill development in India as well as other countries including the UK, the European Union, Turkey and Malaysia so as to make myself aware of the trends. For over two years, the network of interviewees, many of them who were willing converts to my project after an initial stage of either being indifferent if not sometimes even hostile, was developed over many visits. The journey was truly enriching and I owe all of them my gratitude for enlightening me on the value of work and the complex roles and capabilities of these workers beyond economic supply chains. After the first few visits, they opened up with their stories (and some of them, their homes). These

stories have formed the basis of my analysis. As a professional and person, I understand their world, a bit more now, and the respect for their endurance and will to learn has increased manifold. This thesis is a genuine attempt to bridge the policy gap on vocational education and training using their experiences; and being able to tell the stories to the well-intentioned persons in the policy machinery. The latter group and many of their members, have contributed to this study with their perspectives as well.

Over time I have contemplated the possible benefits of this research for four key beneficiaries: a) The policymakers for vocational education and training; b) the employers or owners of small and large units that engage vocational skills; c) potential and some current employees (eventually) through the practice embedded in policy or pedagogy; and d) the research community. The first three categories have, I can say, been touched in some form even as co-creators of this research. Accepting the reality that not all of them - even from my participants list - may completely agree with my inferences, I do owe my gratitude to their opinions expressed and respect the sincerity with which many people that I have interacted with, shared an intent to improve vocational spaces: policy makers, owners, institutional stakeholders and of course, the tutors and experts.

For me, camouflaging the names of the persons and the locations was a procedural and moral necessity. At the same time, not being able to give credit for so many individuals who have occupied my mind-space in this journey was a difficult choice. It took less than five minutes to replace their names with an alias on the word processor, yet they remain in my mind pioneers whose stories I hope to continue bringing to the attention of policymakers so as to people their policies

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## Appendix I (a)

### GSOE Ethics Form Summarizing Ethics Meeting



#### GSOE Research Ethics Form/Report

PhD Student:	Narasimham Peri
Research project:	Examining the role of non-formal education in complex knowledge-production: a study of the Safety Match work and workers in South India
Discussant for the ethics meeting:	This discussion was done in two sessions with Que Anh Dang, Doctoral Researcher and Marie Curie Fellow, GSoE, University Of Bristol on 02.11.2015 and subsequently on 03.11.2015. The draft was discussed with different situations arising from the pilot and potential issues. The suggestions and discussions have been subsequently included in this document.
Name of supervisors:	Professor Susan Robertson (Primary) Professor Roger Dale (Secondary)
Has your supervisor seen this submitted version of your ethics application?	Yes. Discussed and approved on 1 December 2015  Data Collection Approval on 11 March 2016

#### 1. Outline of Project:

The proposed project is the applicant's doctoral research, seeking to explore how knowledge is produced in a non-formal way, in and by, adult workers who perform complicated tasks involving processes, technology and science. A majority of these workers have very minimal or no formal education. The study is located in a unique cluster of semi-urban and rural towns in South India, which produces the bulk of safety matches for India and the global markets.

The subject of the research is expected to contribute to the current discourse on

vocational education and training. The process is informed by the different perspectives of learning theories, education policy, social theories, employability, work-based and workplace learning, adult learning and women's learning.

The study proposes to offer some linkages between the non-formal and formal education methodologies and critical gaps in the vocational education and training policy. Whilst the study is primarily located in India, there are generalisations and inferences possible for vocational education elsewhere.

It is a qualitative study, with ethnographic observations in the locations and interviews with participants. Artifacts and historical documents where accessible will be studied to make inferences or connections with the ethnographic observations or participant conversations. The choice of the field is through two clusters, similar to a 'Russian Doll'. The larger doll has a similar small doll within it, and the smaller one has a still smaller one inside it until the smallest one, which is a miniature replica of the largest. My choice of the clusters is to be representative of the industry, the location, the group and the unit; to provide inferences that are drawn from the data that is credible and true to the research purpose. In the process of doing this, I choose to identify a town (G Town) and a cluster (V Cluster). The latter represents a clutch of villages, very close to each other in the match-industry belt. Within these clusters, the workplaces themselves include those where people formally come to work (larger units) and the smaller ones, many of which operate from the workers' homes.

About 14 semi-structured interviews are provisionally planned, across 3 segments: 1) Employers 2) Employees- Apprentices and 3) Employees- Experienced. There is a further segmentation for those who are directly interviewed (primary respondent) and those who are interviewed for supplementary information (secondary respondent). Where possible, the primary respondents will be interviewed more than once. The interviews with the primary participants will be expected to be in more than one sessions, and if possible in different settings (home, workplace, common places). The secondary respondents will be mostly interviewed/observed at the workplaces.

The duration of the interviews for primary participants is expected to be between 30 minutes and 90 minutes for the primary respondents. For the secondary participants, it is expected to be between 30 minutes to 60 minutes, as the topics covered would be more confirmatory or supplementary to the data already collected from primary respondents or from physical observations. The range is indicative here, based on my experience from the pilot. Some in-situ interviews are in the form of walk-through sessions through the workplace, whilst the participant is showing some process or the other, even as he/she continues to attend to their work tasks.

These will be done during 2016. Some of the participants have been identified in advance, and a pilot study conducted with them (2 participants- one each from segments (1) and (3) above. Artifacts in the form of past photographs by the researcher are proposed to be used as well as other publicly available information regarding the industry.

In addition to the interviews above, I also intend to talk to two policy makers/facilitators on skills/ other experts (typically representing the Government or authorized agencies like the National Skill Development Corporation or NSDC) that influence the policy and practice of vocational education at a federal level.

## **2. Ethical Issues:**

### *2.1 Researcher Access/Exit:*

I have negotiated the access for most of the key interviews. This was primarily done using the relationships that I have built over the last eight years that I have been visiting the match factories. However, I would like to recruit newer participants particularly in the second and third categories (mentioned in 1 above) during the field work, as there will be newer people entering the system- where possible to increase the diversity of data. During my pilot studies, I have discussed the possibility of getting respondents from different locations to get as much coverage as possible from a data integrity perspective. I have identified both my Gatekeepers and keeping in touch with them and updating them of my plans. I have, by virtue of visiting the locations over the years, developed some credibility with the major players, and with my current identity of a Doctoral Researcher with the institutional support from the University Of Bristol, the access for this study is guaranteed. There are expected dropouts, hence building relationships with more than one access Gatekeeper has been a conscious effort.

Since I am not embedding myself in the actual operations of the factories or work-spaces where the workers are working, Exit issues are not foreseen. Entry is relatively a more difficult task than the Exit.

### *2.2 Information given to participants:*

Specific information about the study- its aims, scope, how the data will be used and who will access the study- will be orally given to the participants. For the participants that I have contacted during my pilot, there is a familiarity on what and why of this study. I see an issue with the Information and Consent Statement being signed, as there are two issues here: one is a cultural nuance of not trusting the participants (who are in a non-urban or rural environment). In many cases they may see it as their oral consent not being adequate (the Gatekeepers are also the employers).

A second issue is the possibility of signed letter being seen as a potential risk for the business. Any document is seen as something that can be retrieved at an inconvenient time and presented to parts of the government departments that can be irksome, in the least.

To mitigate the above two risks, I propose the following steps:

2.2.1. Attempt to get the Gatekeeper's consent for the broader study involving the location or the unit where the study is being done.

2.2.2. Use a detailed description that could be vetted of the location without jeopardizing the identity of the participants. This also assists replicability of the research.

### *2.3 Participants' right of withdrawal:*

As mentioned in 2.2 above any form of writing could be detrimental to the study and the collection of data. This was tested during the pilot phase, and the participant sample (which did not include the Gatekeeper) was clearly asked if I could ask them a few questions about their work and themselves, with my background of a researcher. If they did not wish to participate (like was the case with one female worker), they have a right to a) decline a request and b) after participating, to withdraw their participation.

Related to this is my request for taking photographs or taking notes. An audio recorder is an unfamiliar device in the workplace and could affect the quality of the answers. Hence my choice of not using the same. However, where the situation allows, I take a video from my handphone with due permission from the participants and the gatekeeper. During the pilot I was allowed to take photographs and video recording from the camera in some places, and the clips were shown to my gatekeepers. In one instance when the camera panned a female worker, I was asked to delete the video clip.

### *2.4 Informed Consent*

All participants have a choice of participating in the interviews or rejecting my request. It is oral in nature. They are also informed that their names will not be used. Most times, particularly during the first interview, at the work-place where the interviews are proposed to be conducted, there will also be presence of the gatekeeper. However, on several occasions I was allowed access independently with the workers, once they became familiar with my presence. The interview therefore has components of the conversations with the gatekeeper as well as those where the gatekeeper was absent. When I encounter a situation that the participant is uncomfortable with the presence of the gatekeeper, or the quality of answer is impacted, my strategy would be to politely cut short my interview, and prioritise physical observation on the site.

### *2.5 Complaints procedure*

Details of the complaints/queries procedure and contact details are provided to the Gatekeepers. In the first instance, participants are encouraged to contact the researcher, and in the second, either of my supervisors, who may seek support from the research ethics coordinators at the Graduate School of Education.

*2.6 Safety and well-being of participants/researchers:* It is not foreseen that any safety issues to either the participants or researcher will arise. My contact details (e.g. telephone, email) and the addresses of research sites are constantly updated and reported to my supervisors and next of kin. Progress or concerns will be informed over the scheduled Skype calls.

All efforts will be taken to provide a cordial, collegial atmosphere for the interviews without imposing any of the researcher's or participant's views or expressing displeasure at any participants' responses or researcher's questions. Since the research is also being conducted in a culturally sensitive area, the due practices in the area towards men and women, sensitive to culture and tradition will be followed.

### *2.7 Anonymity/confidentiality*

All the participants will be offered anonymity- and their names will be either aliases or a code that is only maintained with the Researcher. The proposed code will however identify the roles, without making the exact location or the particular match unit transparent. Identifying the participants within the categories (Section 1) will be key to the research sample and coverage required for the study. The photographs may identify a particular location. I will ensure to remove any brand names (of the matchboxes) or location identity (by morphing) the pictures or portions that refer to or could compromise my participants. All of their participant data and photographic evidence will be labelled for any audit trail.

The key to all aliases will be stored on a backed up, password protected spreadsheet in a UoB-approved storage device. Only the researcher will have access to this spreadsheet. It is unlikely that participants will be identifiable from any details given in their data, but care will be taken to ensure that any particulars which might endanger their anonymity will be amended or deleted.

### *2.8 Data collection:*

Data will primarily consist of field notes, interview notes, and occasional video clips, where possible with the consent of the participants. Videographic evidence will be collected for production processes that reflected specific areas of the study or its inferences. Photographs of public places and where required, with the permission of the individuals and their organisations, will be taken to reflect both the location description as well as some of the observations for the ethnographic study. All of these will be supported by Artifacts and documentary analysis. The audio and video recordings, where obtained, will be confidentially transcribed by the researcher himself.

A situation arises with language as a potential barrier. The researcher speaks the local language (Tamil) at an intermediate level except the local dialect. During the pilots, the question (from the researcher to the facilitator in English) was conveyed to the participant (in Tamil). When the response came, it was understood by both the Researcher and the facilitator and did not need a reverse translation. However, in some instances there is a double-checking of the answers when the facilitator translates back. As mentioned earlier, the interview is conversational and some of the questions are asked directly by me (in Tamil) without the translation. Member checking usually is done at the end of the interview, or the relevant section, if the interview is being done in more than one session.

The setting is very informal, even while it is at the workplace. As I follow the worker's tasks, the questions are almost spontaneous from my side (even though the conversation covered my list of semi-structured questions in a random order). This reduces the possible effect of the presence of the third person (facilitator). It should be highlighted that the facilitators are specific to the locations and do not carry the conditioning from an earlier location that was studied. The body language of the participant is closely observed while the translated answer is being conveyed.

#### *2.9 Data analysis:*

Participant interviews, the ethnographic detailing and the artifacts (photographs, images in the offices, employee log books) will be presented with accuracy and analysed as the researcher's work.

#### *2.10 Data storage*

All data will be password-protected, backed up, and stored on a UoB-approved storage device. Since much of the field work will be done in remote locations, sometimes with limited internet access, the data will be stored in a Pen Drive that is then transferred to the UoB approved devices/systems.

#### *2.11 Data Protection Act:*

All the data will be in conformance with the British Data Protection Act, 1988.

#### *2.12 Feedback:*


Given the explanation in section 2.2, there is no provision foreseen for any feedback, as it could be counter-productive to the study.


#### *2.13 Responsibilities to colleagues/academic community:*

The University Of Bristol, and the academic stakeholder interests, as well as the participant interests will be foremost throughout the study. No compromise will be made on the reputation of the stakeholders above, at any point of time, keeping in mind the ethical requirements as well as the personal safety of the individuals concerned.

#### *2.14 Reporting of research:*

All the participants will be clearly informed that this study will result in a PhD thesis.

  
Signed (Researcher):  
11/03/2016  
Narasimham Peri

Signed (Supervisor)   
Prof. Susan L. Robertson  
11/03/2016

# **Appendix I (b)**

## **Ethical Considerations**

### **(During and After Fieldwork)**

Ethnographic observations to examine knowledge sharing frameworks are supported by Jack Whalen and Daniel Bubrow through their experiments in Xerox, where they examined practices of knowledge sharing communities amongst service technicians. As part of the Eureka Project (2011), in a way a sequel to Julian Orr's (1996) work in the same area, they examined 'official' procedures and 'informal' practices relating to technical troubleshooting ideas- how these were generated, transmitted and stored in the working realms of "communities" of service technicians.

Many of these practices could not have been integrated into a solution or an acceptable system for both the practitioners as well as the administrative machinery of the organization. For the former, apart from the depersonalization, that is, the lack of tacit individual knowledge-led identity or what Whalen and Bubrow (2011: 272) refer to as 'preserving of the recognition', it could also be the expectation of reward from the discovery of a process to troubleshoot. In other words, the individual needs motivation to be able to part with tacit knowledge that is compelling in an organizational setting. I interpret this as a purposed consequence for the individual through recognition or a reward that needs to be balanced with an organizational requirement to sustain and grow the processual knowledge from an individual experience.

If the purpose of the networks or occupational communities is to bring forth the individual experiences into a spatially collective, temporally cumulative knowledge set, ethnographic observation adds to the contextual detail in which the knowledge events or experiences are observed, recounted or themed within practice. Since this is *in situ*, and largely embodied, the interpretation of the ethnographer is subjected to a different methodological scrutiny, that is dealt with in detail under the ethical dilemmas. However to put it briefly, the role of an ethnographer is intensely subjective and the method adopted in this research had to be adjusted even during fieldwork to maintain the integrity of the respondent views (LeCompte and Goetze, 1982; Greene and Bloom, 1997; Elizabeth Edwards 2002; Hammersly and Atkinson, 2007; Giampapa, 2011; a Pezalia, Pettigrew and Miller-Day, 2012).

Generalisation from the specific to the broader whole has been used in culture studies and social anthropology. Gananath Obeyesekere (1990) argues that the 'intersubjective relationship of the fieldworker and the people he studies is best highlighted by ethnography, and works to the aid of theory' (Srivastava, 2004: 55), increasing the understanding of the working of culture and society. In the process, the ethnographer goes beyond the surface realities of every day understanding,



often questioning the mundane, and teasing a story out of the routine that is perhaps out of place elsewhere. This approach in a workplace, that kept me on a reflexive keel throughout, ranged from my epistemic view of generalization to the methodological choices. The ethnographic approach, and in due course, using the critical realist stance in not only interviews (Pawson, 1996) but also the analysis, was with a desire to provide answers to 'causality of institutions, and practice' (Srivastava, 2004: 55). I argue, in my study, it is not only the institutions and their practices but also their structures that are illuminated in this approach.

A second aspect of the tensions that might emerge in the practice-policy making interface is the acceptance of the 'informal' data representing any form of knowledge production. Official machinery requires 'hard numbers' or authenticated primary responses that bespeak a trend. Even for NSDC, one of my primary institutional respondents, my first request for an interview with a pre-sent questionnaire was subjected to a telephonic discussion by their research team to explain my choice of qualitative methods over quantitative ones. The primary concern was the practicality of adopting a 'non-numeric or a geographically limited primary data source' (NSDC Researcher, February 20, 2016) to be able to generalize reaction to policy measures. I explained that while there would be limitations, I was hoping to put a data trail and contextual reference to the vocational practice that I intended to examine. Whalen and Bubrow (2011:281) highlight this aspect of 'hard bottom line' data while enumerating informal practices to influence the service organization in Xerox. To mitigate this concern, they suggest a responsiveness of the field being listened to, as well as a detailed diagnostic documentation of the field. This, they argue, accentuates the positive intersection areas of officialdom and practice.

In the midst of my data collection, I realized that my field notes and photographs were indeed becoming a primary source of interpretation, aside from the individual interviews through the two-language formula that I explain below briefly, and in the methods in further detail. As I looked at the first set of notes relating to the participants, the second aspect of what Whalen and Bubrow (ibid) allude to, on the diagnostic documentation seemed to have been met to a large extent. I subjected myself to the reflexivity of asking if the field was *really* being listened to? I took the assistance of two gatekeepers to my study, and who understood the local language Tamil, to ensure the responses. I was getting where indeed what I was myself understanding. The three persons, whom I call the interlocutors, enriched the data in two ways: by a better translation than my own; and sometimes providing a local perspective to the use of terms in the workplace or a contextual reference to a practice or work process. One of the interlocutors was a professional field worker in community health, and his distancing from the match context was also useful, as I sought clarifications on some of the respondent's answers to my questions. The semi-structured questionnaire method was effective, and the interlocutor assisted in clarifying my question in English to that in the local language, Tamil. Since my listening comprehension was better than the spoken fluency, the responses were captured by both my interlocutor and myself- I had the additional opportunity to be

making notes around the interview situation itself. But where was the perspective of the participant directly, in the voice? Here is where my interlocutor (after I had come back to write from the first set of visits, *away* from the field) suggested a Tamil translation of the questionnaire itself. The attempts were iterative and we finally had a translated version after several weeks, as the original semi-structured form had to be marginally modified into two sets (one for owners and one for the participant workers) since they had different connotations in the written word, rather than the spoken medium. This was also discussed with my supervisors on December 27, 2016.

The merit and the advantage of the semi-structured form was maintained throughout even as the translated questionnaire was used as a prompt and a data track for the participants. Where possible, an identity track on permission was maintained to provide a contextual richness discussed earlier in this section.

Some of the paid and unpaid respondents gave their assent to be photographed. Voice recordings were consistent in being turned down- as was reported in the pilot findings, almost an year ago.

Member checking of the respondents was performed as above, with the interlocutors with in person and on Skype and telephone calls, with comments recorded on the specific field notes or the individual respondent sheets, including those for whom the translated questionnaires were used.

## **Visual Data**

The first recourse for all the initial work on the pilot studies in August and September, 2015 was done using the guidelines of the Graduate School of Education, University of Bristol. The ethical guidelines questionnaire was discussed in relevance to my study with my supervisors. The process was documented and submitted as part of the progression review in December 2015. Useful perspectives emerged in discussion with my research colleagues, particularly Que Anh Dang, a UNIKE researcher.

As I entered into the research field, it became necessary to consider various other ethical approaches, even as I encountered difficulties in linearly applying some of the university guidelines. I detail each of them, with the my resource references below.

## **Ethical Approaches**

Faced with a unique situation early on, during my pilot data collection in July-August 2015, I had to strike a balance between confidentiality and establishing the credibility of the research task through visual methods; and took inspiration from the ESRC's guidelines (Wiles, et al: 2008). Amongst the four approaches, it was the principalist approach that seemed close to my research context and the pursuance of my research objectives.

The ESRC National Centre for Research Methods has provided guidelines for Visual Ethics, or the ethical issues related to Visual Research. Whilst endorsing the use of such methods for applied social researchers, the centre's review paper (Wiles, et al.: 2008) highlights the lack of specific professional codes and guidelines for these methods (Section 2.3). Consent for collection and use of visual material is covered by the British Sociological Association (2002 and 2006) and the Association of Social Anthropologists of the UK and Commonwealth (1999 and 2011). In addition to the BSA 2006 guidelines, I also relied on the updated guidelines of the British Educational Research Association (BERA, 2011) to ensure accepted and contemporary ethical practices were embedded into this research. In addition to the BSA 2006 guidelines that I detail below, **the BERA guideline of conducting UK based researchers outside the UK adhering to standards within the UK, was relevant to this study (BERA, 2011: Section 13)**. This section also recommends compliance with 'any additional regulation and cultural sensitivities of the host jurisdiction' (2011: 5-6) during the conduct of the research. This includes allowing the participant to be accompanied in the data collection activities. In my pilot phase, when I was not aware of this particular provision, I ended up refusing a participant to have a friend along in the conversation and treated them as two different participants with separate interviews. After I became aware of this guideline, it was easy to have the interviews when a participant requested to have a colleague or a friend listening in the conversation. At times, this increased the curiosity of colleagues and lessened the stress due to attention on the participant.

The updated version of the above (BSA, 2006) offered a comprehensive guidelines list, that covered the difficulties faced during my field work. The guidelines from the Visual Sociology Study Group's statement of ethical practice provided the framework for assessing and correcting my ethical obligations in the field, that went beyond the consent from participants.

I elaborate on the sections of the statement and their corresponding compliance and/or mitigations adopted in the field during the collection of data and thereafter. I call out four specific areas with their corresponding statements that were relevant to the study:

### **1. Professional Integrity: with specific context of Visual Data and Consent**

The foremost concern before, during and after the visual data collection was to ensure safety and risk mitigation for the participants (BSA, 2006: Section 5). Participants had a natural resistance to an outside asking questions about their work, and seeking to record their views. Once this was overcome, after two visits, repeated reassurances and using gatekeeper access, the segmentation of the sample was broadly attempted (Annexure of Sample). Consent was obtained for the use of photographs using the Photo Reproduction Rights Form suggested by the ESRC (2008). This was applied to participants as well as the Interlocuter, who assisted in two ways: as a gatekeeper in some cases and as an interpreter from the local language Tamil to English and vice-versa.

The issue of consent (BSA, 2006: Section 26), is again brought up here, as it represented a unique situation during the fieldwork. As the primary objective of examining non-formal ways of knowledge production amongst adult workers in the workplace was to look at a sample of workers who had little or no formal schooling at all, the question of getting their signatures was impractical. There were very few exceptions to this rule, and I have in the visual images identified those who were able to write (Appendix Sample) The preamble and the introduction to the questionnaire was read out to each participant, and explained to them. Midway during the data collection, a dual language questionnaire (English-Tamil) was used to assist the participants to feel comfortable with the process. Some of them who looked at the sheets and did not know or understand the English script used the Tamil works to a minimal extent and were able to read a few questions that were also orally administered to them through the interlocutor. From an ethics compliance point of view, three conditions were met with: explaining the purpose of the research, the data collection and the confidentiality and the voluntary nature of the participation. Six of the participants who were approached during the entire data collection exercise in phases refused participation (BSA, 2008: Section 28) and one withdrew from the exercise after the first round of interviews in Sivakasi Cluster. The information and data collected from the latter was immediately destroyed. This reflects in the serial numbers of the member checking sheets collated from the interlocutor answers.

## **2. Dilemma of Signed Consent**

There were two issues relating to signed consent: the first was the illiteracy or limited literacy of the participant workers that disallowed any signing. Secondly, in a cultural context of south India, any form that is signed is deemed as official- as in the government documentation, and viewed with extreme caution. 'Signed' in the case of illiterate signatories was in the form of a thumb impression on the document: the right thumb in case of male, and the left thumb in the case of a female. My gatekeepers advised me to avoid asking for the thumb print as there is a general distrust for any government document using a thumbprint, which was mostly used in case of land and property. Reticence from the participants was noticed and I asked only a general question on whether they would be willing to provide a signed consent in case they could sign their name- not use their thumbprint. Using a thumbprint in some case of younger women was seen as a social negative and I avoided getting into any cultural insensitivities, a point that the BERA ethical guidelines also advise (2011: 5). In most cases, with exception of only six participants during the individual interactions, they allowed for pictures to be taken in the background of their workplace. In such cases, I also used the reference to index my responses into my data for traceability within my research. Anonymity has however been maintained for all cases where this is concern of identity of self or the workplace.

The BSA guidelines regarding the responsibility of researcher to ensure research field is conducive to successive research (BSA, 2006: Section 48 ) was helpful in ensuring

that my work was balanced with my objectives and the participants expectations from my work. All of them were aware of a form of documentation being done, that could inform policy, and their views were entirely voluntary. Over multiple visits, there was decreasing resistance to my presence. On the contrary, the interactions were cordial, and even friendly with candid comments on the workplace, that were not visible during my earlier visits. Some locations were more welcoming than the others, but this did not any way dilute the principles of work that I was looking for across different scenarios in my field sites. The BSA guidelines urge the researcher, to establish and maintain a credibility established in the field for further studies in the future. The habitus of the match industry, despite this being a one of a kind research in the industry, could welcome more research if the participants see the benefit coming to them in the form of policy visibility.

### **3. Relations with and Responsibilities towards Research Participants**

As explained elsewhere in this study, the sensitivity of the match industry and the competitive nature of the industry, offered no easy options of access to participants. Both the owners and the workers were resistant to any approach suspecting the research to be sponsored by some government agency. The academic credentials of the university assisted in reassuring several participants, and it was customary for me to carry my university identification that clearly called out 'STUDENT'. This worked in most cases where English was comprehended. At all times I ensured that there was no threat to any job or isolation due to my interaction with the participants (BSA, 2006: Section 21).

Due to illiteracy that was explained in the previous section, participants' consent was taken for pictures. This was in the form of their willingness to be photographed with their work in the background. Except in three work units, whose managers felt that it was important to be anonymous, all others acceded to requests of pictures. In these cases, all visual recording requests were denied. Some of them only allowed for neutral zones without either the worker or the brand being manufactured shown clearly. All the photographs were shown to the participants. In several cases, an inadvertent close up was immediately deleted. Voice recording was not permitted due to unique identifiers. However visual recording of the processes from a distance as well as taking notes was mostly permitted (BSA, 2006: Section 29). In a few cases, the interviews were conducted in public places, given the cultural sensitivities of women workers being talked to by a stranger. Some of the workers were also interviewed at home, where they were also conducting work (REF Participant Number: Kanakam, Chapter 6), and represented knowledge claims of an extended workplace that morphs the boundaries of home and work identities.

In addition to explaining the purpose of the research, the use of data (BSA, 2006: Section 31) and its storage was explained to the participants.

Member checking was performed with policy actors via email and the owner category of the primary participants (BSA, 2006: Section 32), but was not done for

individual primary and secondary participants, whose comments were conducted through ethnographic approach and field notes. For the purpose of visual images, care was taken to avoid multiple individuals in a photograph, where the consent would have been problematic or impractical (Rose, 2003; Prosser, 2000). Pink (2003) emphasizes the need to develop mutual trust and a positive relationship with the participant, in such a way that the images are a consequence of collaboration and not unilateral. In several cases, where I had consent, the position of the participant in the photograph was suggested by the participants themselves. As a practice, every image was shown from the smartphone camera used in the process of capturing both still images and video images. Video images were used to capture the process of working, and served as a prompt for me to write my notes at the end of a particular round of doing the interviews. This method is also elaborated in the data collection section of this study. The consent was not limited to the taking of the images but also the permissions to use them subsequently (Prosser, 2008: Section 3.1. ESRC NCRM/011). For the detailed use of a set of photographs that were taken with the interlocutor and his image included with the participants to capture the method of data collection, a modified format suggested by the ESRC (2008) was used to obtain specific consent.

However, during the conduct of the research, verbal consent due to the situation and the time allotted was taken before each visual image was taken. The purpose was clearly explained along with the purpose of the research: in most cases the images or videos pertained to the questions to the participants themselves, so it was in the context of the research questions (Banks, 2001; Rose, 2007)

BSA, 2008: Section 35

BSA, 2008: Section 37 (write about this when the research had to be conducted outside of the workplace)

#### **4. Anonymity, Privacy and Confidentiality**

BSA, 2008: Section 46

BSA, 2008: Section 48

BERA, 2011: Section 25

BERA, 2011: Section 26

BERA, 2011: Section 27 (regarding provisions of the Data Protection Act, 1998)

Anonymising the information in the photographs, and still images, I kept an index of the photographs with the participant name and response in a digital file. This was securely kept with a digital password and only for use to show a trail to my supervisors and data audit. The consent forms, for the purpose of this explanation, also included disclosing the information of the research to any authorized person for the assessment of this research by the University of Bristol. These are in hard copy along with the questionnaires used in the second phase.

After my initial phase of data analysis, the photographs with the participant faces were masked. Only where the participants insisted on their identities to be made known, the pictures were intact.

This was however not done for policy functionaries as they were public figures. However one of the respondents, a policy maker, after seeing the transcript of the interview, insisted on anonymity to specific statements that were made during the interview. After a dialogue with his team, these were expunged from the interview.

#### **Where this study encountered tension with the guidelines:**

The ESRC (2008) guidelines suggest anonymity for the place and the individual. Where consent was obtained, this was not an issue. However I had to take images of the public spaces, and some of the work sites, where the research was conducted to be able to write my notes and correspond the data from the individual to the context of the worksite, with accuracy. In such cases, contrary to the guidelines of the Section 4.5 on the images of place (ESRC, 2008), the image of the place played an important role in situating the right knowledge claims from the primary data. For my follow-up discussion with the policy makers, this data was masked and could not lead to any individual or place identification using my research markers. My research markers, were shared with my supervisors at relevant times to ensure that I was on the right track. The stories used in the data analysis and the emerging themes has substituted names. Without the names, I found a challenge in representing the richness of the context. The references were markers for traceability of participants, and were only available with me.

## Appendix- II

### List of Locations and Workplaces where studies or interviews were conducted

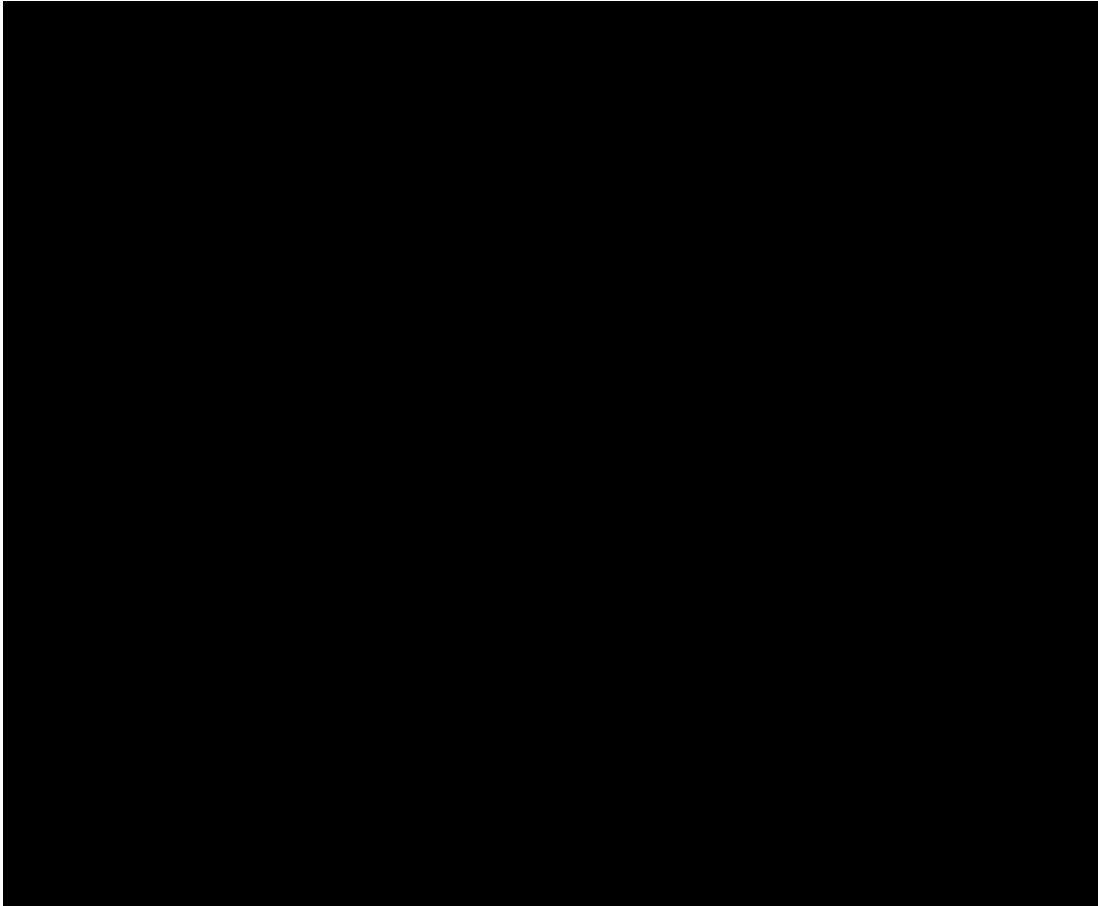
Town/Village	Reference	Name of the enterprise (if allowed) or unique identifier for the research	Type of Match Industry
Gudiyattam Town	L1	*JK Match-1	Semi-mechanised
	L2	*RM Works	Manual Process/ Cottage Industry
	L3	*VX Matches (now closed)	Fully Mechanised
Sattur Town	L4	Rajashree Matches	Fully Mechanised
	L5	Rajashree Matches-2	Semi Mechanised
Arupukottai Village	L6	*RS Matches	Semi Mechanised
Sivakasi Town	L7	*PT Matches-1	Fully Mechanised
	L8	*PT Matches-2	Semi mechanised
	L9	ANM Match Industry	Cottage Industry/ Manual Operations
	L10	*VK Matches	Manual Operations, Job Works to larger Units
Kovilpatti Town	L11	*EN Match Industry	Cottage Industry/ Manual Operations
Maraneri – Suburb of Sivakasi	L12	*EV Matches	Manual Operations

\*Pseudonym used, at the request of Participants/Owners to protect business/identities.



## Appendix III

### Map Showing the Match Industry



Maps Courtesy: Maps of India. Only for representation- not to scale

## Appendix IV

### List of Participants

**Category 1:** Primary Respondents (PR)- who were the key participants and offered the initial insights. The meetings with them ranged from 2-5 with each meeting lasting 15 minutes to 90 minutes in a semi-structured manner (See Chapter 4 of thesis).

**Category 2:** Secondary Respondents (SR)- who were the supplementary providers of information and helped connect the dots with what the Primary Respondents (PR) had said. The repeat meetings with the PR were conducted based on what the SR had corroborated or refuted.

**Category 3:** Institutional Respondents (IR)- Representatives of the Government, National Skill Development Corporation (NSDC), Programme Implementation Advisors of Labour, State Government and Instructors/Teachers at the Polytechnic Colleges.

**Interlocutor/Translator:** (PRL) V Chockalingam in Gudiyattam and Dhanya Padmanabhan in Sattur, Thiagarajan in Sivakasi

Gudiyattam	PRL-1	V Chockalingam	Assistance in accessing Small job-work Units and oral translations
Virudhunagar	PRL-2	D Padmanabhan Interlocuter – 1 (DP) (Female, Owner Representative, Bilingual and Educated, Raised locally. Disadvantage was she represented a power imbalance where the participation of the respondents was imperative). The questions relating to power equations and choices may have been socially desirable.	Interlocutor, oral translations of conversations and assistance in accessing respondents <b>(Signed Consent)</b>
Both Locations	PRL-3	Thiyagarajan	Interlocutor,

		Interlocuter – 2 (ST) (Male, Outsider to the workplace, used extended and commercial networks, Bilingual and had field experience as a social worker. No power balance. However all the respondents were not voluntary and an honorarium was offered. To an extent, this also mitigated that fear that he would be an official representative of the owners.	Development of Tamil Questionnaire, Interview assistance and member checking <b>(Signed consent by email as well as individual translated responses)</b>

#### Respondent List – Index

	Reference	Demographic of the participant and importance to the Data Category	Name (if allowed or Unique Research I/d)/thematic connect with the individual that was used in the Research
<b>Primary Respondent</b>	PR- 1	Owner, manager of the match enterprise.  Manual and semi-mechanised processes.	Chockalingam, Gudiyattam. 45 years in the match business, a second generation of match unit owners, family and extended family in the business; seen as a patriarch and claims to have trained, more than 2 generations of match workers in his 45 years, .
	PR- 2	Owner, manager of the match enterprise. His next generation has taken over the business. He is a school dropout but his successor is an engineer.	Padmanabhan, Sattur. 35 years in the match business. No extended family in the business. A first generation match entrepreneur, he has built a reputation of being a high quality producer (SR-

			13) and is reputed to be a technical expert, even without any formal qualifications (SR-8)
	PR- 3	Manual Unit, owner. Employes mostly part-time female workers. Second generation worker-owner	C Veluchamy, S/o Chinnasamy
	PR- 4	Gudiyattam, owner (husband, wife, brother team and 8 female manual workers) All manual operations	He was a worker and then set up the operation 25 years ago.
	PR-5		K Nallammal
	PR- 6	Joshua, crimping machine, first factory, ground floor, Sattur	Picture of the learning moments and the master trainer helping apprentices to “be comfortable” or “ <i>kashtam velai</i> ” to “ <i>vasatiyana velai</i> ” by observing him
	PR-7	Manual and Semi-automated unit, Female worker, Kitchanakampatti Village, Aged 38 years, working since 26 years. Studied until 12 standard (not completed). Family migrated from Tuticorin the south TN to find work.	V Ponnaswari, W/o Vetrivel (Ponni)
	PR-8	8 <sup>th</sup> standard failed, Male Worker, Sattur, self-taught repairman	*Sripati, who was an electrician before he came to work here, 11 years ago
	PR- 9	Male, 46 year old, studied until the 5 <sup>th</sup> Standard, has worked in the match units for 20 years	V Palpandi
	PR-10	Female Worker, 39 years old, Studied upto the 6 <sup>th</sup> Standard. Has been working full time	Unnamed with Sundari  Highlighted concept of

		for 3 years now. Location Sivakasi	safety learning alongwith process.  <i>Vaalkkai and äadharam</i>
	PR-11	Owner worker. Wife and Brother are also engaged in the same unit. Employs variable labour between 8-14 women on box filling. Core areas, particularly the chemical mixing is done by the owner.	*Rajendran, Gudiyattam.
	PR- 12	Male worker, migrant, high school completed, automated machine operator	*Amin from Assam First person from “outside “ the match industry family networks Vignette 1, Chapter 5
	PR- 13	Manual Work, Female worker 40 years, worked for 20 years. Illiterate (uses thumb impression and cannot sign), has not been to school. Has worked as a daily wager and has not known permanent employment; trained more than 15 people in her kind of work. She is seen as an expert on the floor ( <i>akka</i> )	Panchavarnam, w/o Kandasamy
	PR- 14	Sattur	*Sarita. Studied until the 8 <sup>th</sup> . Performs multiple functions. Floor supervisor. Allocates the trays and monitors the filling process with the piece-rate note books.
	PR- 15	<i>theriyum-</i> or “that everyone knows”  Santhi, “the commonness” of uncommon learning and the hidden	The unwritten body of things to be done by observation (Orr, 1996:146) and actions performed were commonly answered with the word. This is linked to the affirmative comments

		mechanisms	of SR-3
	PR- 16	Kanakam – lady in the video. Neighbour to Ganesan (PR-11)	40 years of experience, self taught, high quality work in the frame-filling skill. Gets better commercial rates as she has less losses from the matchsticks on the frames. Sought after worker. Works part time. Advisor and <i>akka</i> .
	PR-17	Ayyappan- trainer, expert	Choice of apprentices.
	PR -18	Pandian, functionary, Match Association, Sivakasi	Access to the Research document that was submitted to the Ministry for taxation. Name withheld as the identity needs to be protected because of his role. Sivakasi
	PR- 19	Nathan	Sivakasi
	PR- 20	Varadan- the slate writing codification	Location L6 Arupukottai
	PR - 21	*Sundararajan, Polytechnic Instructor, Virudhunagar	
Secondary Respondent	SR- 1	Gudiyattam- assistant to Chockalingam- Phase 1 List	
	SR-2	Sivakasi- phase III list	P Vijayalakshmi, W/o Palanivel
	SR- 3	Acknowledging the need to know processes that are not documented- “everyone knows”. The everyone knows is an emphatic stating of expectations that – all people who work here <i>must</i> know	Muneswari K

	SR-4	Suvarna, Manikya and Chitti: Joint interview to understand the work environment- Ganesan's unit in Gudiyattam	Workspace relations. How old teach the new. Akka as a skilled level is reinforced here
	SR-5	Sunitha	Adapted from manual to automation
	SR- 6	Sattur-Ph 2 List	
	SR-7	Sattur-Ph 2 List	
	SR- 8	Sattur-Ph 2 List Male Worker in Sattur, Unit who has worked in both manual and automated operations. Examples quoted in PR-1 response and ethnography of the automated workplace	
	SR- 9	Sattur-Ph 1 List Female worker in the semi-automated Unit Self taught. Studied upto 7 <sup>th</sup> standard in village school.	*Lakshmi.  Current supervises around 30 female workers.
	SR - 10	Male Worker. High School completed. Migrant labour from Assam. Running machinery and is not familiar with the	*Moumin from Guwahati, one of the followers of *Amin and the group of seventeen.  Vignette 2. Chapter 7

		traditional systems in the match industry	
	SR- 11	Sivakasi-Ph 3 List	
	SR- 12	Gudiyattam- Ph 1 List	
	SR- 13	Sattur- Ph 1 List Worker in Virudhunagar Cluster. Corroborated the workplace observations and comments on PR- 1	
<b>Institutional Respondents</b>	IR-1	NSDC- Ex Senior Functionary, who I corresponded with for policy inputs and permission of doing project- 1	Attach Mail
	IR-2	NSDC-Former Senior Functionary- who reviewed my project	Interview notes
	IR-3	Research Unit Member	Answered on behalf of the new CEO Attach Mail and member checked answers
	IR-4	Research Unit Member, Ministry of Skills	Interview Notes and Mail Correspondence
	IR-5	Teacher of Vocational Training Institute, Tamil Nadu	Interview Notes



## Appendix V (a)

### Match Industry Data- Question in Parliament showing number and distribution of Match Units

LOK SABHA

UNSTARRED QUESTION NO. 4150.

To be answered on the 4th April, 1984.

Tiny Match Manufacturing Units

Q450. SRI M.A. DODAI SEBASTIAN:

Will the Minister of Industry & Commerce

be pleased to state :

(a) the number of cottage and tiny match manufacturing units, State-wise figures, enjoying the excise duty concession of Rs. 1.60 per gross for wooden matches;

(b) the number of small scale match units in the country, State-wise figures enjoying the excise duty concession of Rs. 4.50 per gross for wooden matches; and

(c) whether these cottage and tiny units and small scale units are also manufacturing cardboard matches and if so, the quantum produced by them?

ANSWER

THE MINISTER OF STATE IN THE MINISTRY OF INDUSTRY  
SHRI S.B.P. PATTABHI RAMA RAO

(SHRI S.B.P. PATTABHI RAMA RAO)

(a) & (b): Statements (Table I & II) are enclosed.

(c): Some of the small scale sector units are also manufacturing cardboard match boxes and their production during 1982 was 9,76,000 gross match boxes. It has been reported that none of the cottage sector units are manufacturing cardboard match boxes.

.....

'C'

Table-I

2

Tiny & Cottage Match Units enjoying the Excise  
concession of Rs. 1.60 per gross for Wooden Matches ..

Sr. No.	STATE/U.T.	No. of Units working		
		Under KVIC (incl. Co-operative)	Others	Total
1.	Andhra Pradesh	120	183	303
2.	Assam	3	-	3
3.	Bihar	7	-	7
4.	Delhi	3	-	3
5.	Gujarat	4	-	4
6.	Himachal Pradesh	2	-	2
7.	Haryana	31	3	34
8.	Karnataka	64	82	146
9.	Kerala	230	-	230
10.	Madhya Pradesh	3	5	8
11.	Maharashtra	15	1	16
12.	Manipur	1	-	1
13.	Orissa	9	-	9
14.	Punjab	1	-	1
15.	Rajasthan	7	2	9
16.	Tamil Nadu	3306	5657	8963
17.	Tripura	7	2	9
18.	Uttar Pradesh	51	19	70
19.	West Bengal	6	3	9
Total		3070	5957	9027

3

Table-II

Small Scale Match Units enjoying the excise  
duty concession of Rs. 4.50 per gross for  
Wooden Matches

<u>S.No.</u>	<u>State</u>	<u>No. of Units working</u>
1.	Andhra Pradesh	5
2.	Bihar	1
3.	Gujarat	1
4.	Uttar Pradesh	1
5.	Karnataka	5
6.	Kerala	6
7.	Madhya Pradesh	1
8.	Orissa	3
9.	Punjab	1
10.	Tamil Nadu	981
11.	Uttar Pradesh	2
12.	West Bengal	1
		<u>1,008</u>

Remaining States & Union Territories have no units.

## Appendix V (b)

### Match Industry Circular – Showing Number of workers in Organised (Formal) and Unorganised (Informal) sector

Tel: "HANDMATCH"

Phone : 20652

South India Match Manufacturers Association,

26/C1, ETTAYAPURAM ROAD, KOVILPATTI - 628 501

Date 8.07.2001

STATEMENT SHOWING THE DETAILS OF LABOURERS IN THE ORGANISED SECTOR AND UNORGANISED SECTOR DURING 1970 & 2001 And OTHER DETAILS

Sl. No.	Details	1970		2001	
		Organised Sector	Unorganised Sector	Organised Sector	Unorganised Sector
1.	Total Strength of Labourers	2 Lakhs		7 Lakhs	
2.	Total No. of Factories	1000	1000	1000	10000
3.	Production and Labour Strength	88%	12%	45%	55%
4.	Job Security to Labour	Guaranteed	No Job Security to Labours	Guaranteed	No Job Security
5.	Functioning	Throught the year	Irregular Puction	Functioning Throughout the year	Now as controlled by the Traders functioning throught the year
6.	Statutory Obligation	ESI, PF, Holiday and Leave Wages group insurance of Rs.50,000 Labour Welfare and Child Labour Welfare funds gratuity and Bonus etc.	NIL	ESI, PF etc. Prevailing	No

As there was no alternative permanent job security to them they worked in C class factories on contract basis. At that time their average weekly wage was Rs.12/- wherein they paid Rs.1/- towards PF and ESI in order to safeguard

From 1990 onwards due to enormous growth of D Class factories wherein opportunities to the workers, the women workers started fleeing from C class to D class in order to avoid deduction of ESI, PF etc. since this is not better

## Appendix VI

### Match Industry Tax Structures: The nature of work is dependent on this categorization

 **SOUTH INDIA MATCH MANUFACTURERS' ASSOCIATION**  
Affiliated with: Tamilnadu Chamber of Commerce & Industry, Madurai  
Tamilnadu Small & Tiny Industries Association, Chennai  
27-8, Ettayapuram Road, KOVILPATTI - 628 501 (Tamilnadu).  
Regd. No.21/88  
Cable : SIMMA  
Phone : 220652

President	Vice President	Secretary	Joint Secretary	Treasurer
R. NAVANEETHA KRISHNAN	R. JAYAPRAKASH	J. DEVAOSS	S.M. ANTHONY BARATHI	R. VENKATESH

23.11.2012

To

The President  
Tamil Nadu Small & Tiny Industries Association  
Guindy  
Chennai – 32

Respected Madam,

Sub: Match Industry – Safety Matches – Partially machine made units – request to rescind Excise duty- Reg.

It is submitted that before 2003 there were 4 categories in the Safety Match Industry and Central Excise duty was levied based on Labour potentiality with support of different colours of Excise stamps for each category i.e. 1. Yellow colour for Tiny Sector 2. Blue colour for Small Scale industry 3. Red colour for Partially Mechanised and 4. Maroon colour for Fully Mechanised. Before 2003 safety matches were manufactured only in the Central Excise and Arms Act licenced premises.

HENCE BEFORE 2003 WE CAN IDENTIFY THE SAFETY MATCHES MANUFACTURING PREMISES, CATEGORY OF INDUSTRY DUE TO DIFFERENT COLOURS OF EXCISE STAMPS SUPPLIED BY DEPARTMENT ON COLLECTION OF EXCISE DUTY WHICH PREVENTED NON-PAYMENT OF EXCISE DUTY.

After 2003 there is no Excise Duty for fully hand made match industry and advalorem duty levied for partially and fully mechanised industry without Excise stamp. It leads that matches in the market could not be identified whether it is duty paid or non duty paid machine made or hand made because in the outer look there is no difference but if we open the fully machine or partially machine made boxes the chemical dipped splint has punch in the non-chemical dipped side but the same will not find place in the Fully hand made.

After 2003 the Central Government allowed the sales of chemical dipped splints to any body. It led people to start manufacturing matches in the godowns getting chemical dipped splints from partially mechanised units without any licence wherever the labours are available and selling them as Hand made matches without payment of Excise duty. Due to non-availability of labour and economic point of view the so called hand made match manufactures also purchasing chemical dipped splints from partially machine made match units and manufacturing in their places and selling them as hand made matches without payment of Excise duty. Further now the traders also are making their own brands of outer



## SOUTH INDIA MATCH MANUFACTURERS' ASSOCIATION

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Regd. No. 21/88  
Cable : SIMMA  
Phone : 220652

President	Vice President	Secretary	Joint Secretary	Treasurer
R. NAVANEETHA KRISHNAN	R. JAYAPRAKASH	J. DEVADOSS	S.M. ANTHONY BARATHI	R. VENKATESH

and inner skillets purchasing chemical dipped splints from partially machine made units and giving them to the brokers for making match bundles on commission basis. These brokers have godowns without name board and address in which they convert the dipped splints inner and outer boxes into match bundles. These brokers even gave the above said articles to the dwelling houses also and get manufactured match boxes and giving them back to the traders who are selling these matches in the market without payment of central excise duty on the guise of handmade matches as the Central Excise authorities have no control over them. These people are day by day increasing in quantum and the legitimate duty paying sincere and honest industrialists are sinking day by day. This can be seen from the Collection of excise duty in the last six months. The total turn over of this industry is approximately Rs.1600 crores per annum which should give collection of minimum Rs.75 crores per annum. This can be verified from the Collection for the last 6 months.

The present status of the industry:

<u>Sl No.</u>	<u>Details</u>	<u>Excise Duty</u>	<u>Production details</u>
1	Handmade	No Excise duty	Approximately 1%
2	Partially machine made	6% advalorem duty	Approximately 79%
3	Fully mechanized	12% advalorem duty	Approximately 20%

Now, day by day the export of matches is increasing due to modernization (partially machine made) of the industry, gets more foreign exchange.

### PRAYER

To save the honest and sincere duty paying match industrialists the excise duty on safety matches may be removed since it is the only possible way.

Thanking you

Yours faithfully,

(J.DEVADOSS)  
Secretary



## Appendix VII

### Exemplar: Skill Gap Analysis using Policy

Tamil Nadu Skill  
Gap Assessment | 94

- Skill Development Initiative-Modular Employable Skills
- Centres of Excellence
- Upgradation of Govt ITIs under Public Private Partnership (PPP) mode
- Skill Initiatives of TNSDM

#### Craftsman Training Scheme

- Focus on less privileged sectors of society
- Aims to ensure steady flow of human resources with close industry interaction
- Stipends for trainees range from Rs.100/- to Rs.175/- a month; poorer students are given two sets of uniforms, a pair of shoes, free training, and a free bus pass
- Award schemes for instructors, and refresher training programs are organized for instructors at central training institutes and advanced training institutes

#### Apprenticeship Training Scheme

- Trainees sponsored as apprentices to industrial establishments for 6 months – 2 years
- Over 110 trades represented at 1868 Industrial establishments
- 11,628 apprentices currently in training
- Stipends range from Rs. 1490/- to Rs. 2220/-

#### Examinations

- All India trade test
- 31,831 trainees appeared to earn National Apprenticeship Certificate
- Wireman helper competency examination is held once in three years
- Eligibility requires trainees to be of 21 years of age, with 5 years of experience
- So far 4586 candidates appeared, 2521 were successful

#### Skilling Initiatives

- Total outlay of Rs. 1.20 crore
- Plans for a vocational training institute for high technology aircraft manufacture and maintenance for DGCA in consultation with the CII
- E-Learning initiatives for 10 trades identified by industrial partners
- Smart cards are issued to trainees
- Associated faculty development institute is also being planned in consultation with the CII
- Curriculum changes emphasizing soft skills have been proposed for implementation in arts and science colleges in association with CII and NASSCOM

#### Modular Employment Skills

- The emphasis of this scheme is on short term skill programmes
- Trainees are given minimum skills required for employability
- 100% funding by the central government in terms of remunerating training institutions for their costs
- Training is free for any trainee who has passed 5th std

#### Development of Centres of Excellence

- This policy was announced in 2005-06. Initially, five ITIs were upgraded to centres of excellence at a cost of Rs. 1.6



*Could the match industry  
ask for a subsidy using  
this? Given that 100% of*

Chennai, also focuses on the BPO, KPO, retail and hospitality sectors and on soft skills. Empower seeks to meet the requirement for IT and software professionals in Chennai and Kancheepuram. ISDC has set up the Chennai IL & FS Skills School where it offers a certificate program for BPO, electrician, welding, debt recovery and sewing machine operator; and Palladam Multi Skill School in Tiruppur offers courses in animation, welding, BPO, civil supervisor, CNC operator, English, fitter and garment engineering, among others. TalentSprint, with two centres in Chennai and one in Virudhunagar provides courses for the BFSI and IT industries. Providers, with centres in Chennai and Sivaganga, offers courses in IT, ITES and hardware. TMI in Chennai seeks to bridge the skill gap for BFSI and sales. B-ABLE has a centre in Nagapattinam for training business correspondents and IJT has set up one centre at Tiruchirappalli.

The distribution of vocational training (VT) centres across districts based on government statistics is depicted in the figure below. In per capita terms, the availability of training infrastructure is relatively high in districts such as Cuddalore, Dharmapuri, Erode, Kanniyakumari, Perambalur, Pudukkottai, Sivaganga, Thanjavur, Theni and Tiruchirappalli; while it is low for districts such as Ariyalur, Krishnagiri, Thiruvallur, Thoothukkudi and Tiruppur.

#### 7.1.1 Existing Training Schemes

State level skill development initiatives are implemented through the Training Wing of the Department of Employment and Training (DET), which coordinates the efforts of Industrial Training Institutes and Advanced Training Institutes in the skill development space. It is also responsible for collecting data and monitoring Industrial Training Centres and industrial schools. Hence, the DET acts as the nodal agency for all government-led skill development efforts in the state.

The state is divided into five regions: Chennai, Coimbatore, Madurai, Tiruchirappalli and Tirunelveli headed by Regional Joint Directors who supervise the Training activities in both government ITIs and private ITIs. There are 62 government ITIs functioning across the state, each with student strength ranging from 100 to 1000. ITIs are headed by Principals in the cadre of Training Officer/Assistant Director/Deputy Director depending upon the trainee strength.

The Tamil Nadu Skill Development Mission (TNSDM) was instituted to create employment opportunities for unemployed youth in a time bound manner. The steering committee is headed by the Principal Secretary and the Director of Employment and Training acts as the state project director. The Additional State Project Director oversees the operations of the mission under four units – the procurement unit, the finance unit, the institutional development and training unit and the monitoring and evaluation unit. In 2011-12, TNSDM was allocated Rs. 2020.8 lakh for activities such as setting up a world class training institute, developing e-content, creating smart cards for skilled candidates, advanced faculty development institute, conferences and promotion, state skill registry and reimbursement of training costs for 15,000 youth.

The Tamil Nadu Skill Development Mission is envisaged to enter into partnerships with industries to identify skill gaps and design course material for Modular Employable Skills (MES) courses. Under the approach to the 12<sup>th</sup> Plan for Tamil Nadu, a Faculty Development Institute under Public Private Partnership (PPP) is planned in order to meet the shortage of quality trainers in the state. TNSDM will also create the Tamil Nadu State Skill Registry to collect and monitor skill data. A world class training institute is proposed to be set up under PPP as a Centre of Excellence to train students in specialized skills in areas such as aircraft maintenance, manufacturing, shipping and servicing with international certification.

#### Major Existing Training Initiatives

- Craftsmen Training Scheme
- Apprenticeship Training Scheme
- Industrial Schools



## Appendix VIII

### Artifact: Extract from a trade souvenir

#### The Match Makers of Sivakasi

(Legend: The self-employed town)

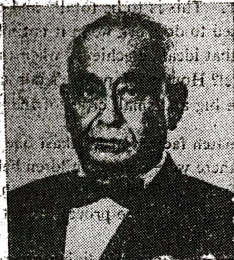
It's time to point out that no one starves in Sivakasi.

### The Self-employed Town

The People's Union for Civil Liberties doesn't have very much to say about the thousands of rich children who occupy valuable educational space, yet don't know what to do with their education at the end of it all or put it only to traditional use, continuing the tainted system of government and business that operates in the country. The Union also has nothing much to say about the millions of children from the country's agricultural areas, who have little or no education, are undernourished, and continue to swell the numbers of the unemployed. The PUCL finds it much easier to dig up dirt about anything that is organised, such as the labour practices in Sivakasi. Not a word does it say about full employment in Sivakasi, the fact that it has one of the highest literacy rates in the country and that almost every family has a skilled worker in it, often a technically qualified person. Nor does it talk about the fact that no one starves in the Sivakasi area, that almost every family is content with the fact that all its members are earning members, and that there is more happiness in the Sivakasi area than in most parts of the country.

These thoughts struck me more forcibly than usual because the PUCL's report about child labour in Sivakasi appeared about the same time 78-year old P. Iyya Nadar's death was reported and while the former got a lot of headlines the latter was merely noted for the record. Which was improper, for Iyya Nadar was the father of the industrial revolution in Sivakasi, the man who brought the match industry there and changed a market town into a thriving industrial hive of activity. There are few towns anywhere in India that have a greater work ethic, or so totally industrialised as this little town in southern Tamil Nadu that is the match capital, fireworks capital and printing capital of India.

The man who made Sivakasi's leadership possible in three national industries was Iyya Nadar. In 1922, the teenaged Iyya Nadar, looking for something different from the family's rice and money-lending business, spotted an advertisement that offered training in a match-machinery manufacturing firm in Calcutta. He and his cousin



**IYYA NADAR**  
great visionary

A. Shanmuga Nadar jumped at the chance and spent six months in Calcutta. On their return, they imported a German machine and with a capital of Rs. 10,000 started semi-mechanised match-making. But marketing was a problem and sales were poor. Iyya Nadar also found that hand-made matches were as good and could be produced cheaper. Such production would also be in tune with the Swadeshi Movement of the day, whose leader Gandhi was Iyya Nadar's hero. So they sold the machinery to Ceylon and each set up his own unit in 1927. Shanmuga Nadar later became famous as Kaka Shanmuga Nadar, nicknamed after his matches.

Iyya Nadar, who believed that the Japanese way, was best for India, in an interview not long before his death that hand-made matches were the answer to Sivakasi's problems. The town was in dry belt and the villages around could not survive on agriculture. Something had to be developed to ensure his dream of full employment in the area. And he developed the match industry that began it all. Today, he said, there's hardly a person within a ten mile radius of Sivakasi who does not have some sort of education and some skill.

The founder of the match industry in Sivakasi did not stop there. He started the first fireworks factory in the area as a logical adjunct of his match works and, today, Sivakasi produces 90% of the country's fireworks. To ensure adequate packaging for the matches and the fireworks, a printing press was set up in 1931. This was a public limited company and Iyya Nadar was once again involved, this time as a partner. Today, no part of the country has a bigger printing set-up than Sivakasi.

100% Cent per cent profit in matches" was the lure of the advertisement Iyya Nadar read in 1922. Before he died, he made it come true not only for himself but for thousands of others in business in Sivakasi who depend on matches and all its ancillary industries. More important, he helped create an industrial town the like of which there are few in India, a town where people eat and live a comfortable working life without fear of a breadless morrow. It is a Tamil Nadu tragedy, nay, a national tragedy that a man who pioneered industry in this country has died unhonoured and unsung.

SY: "ASIDE" PUBLISHED IN FEBRUARY 1983

## Appendix IX

### NSDC Context Note

The National Skill Development Corporation (NSDC) was set up as a Public Private Partnership (PPP) company with the primary mandate of catalyzing the skill landscape in India. It operates through partnerships with multiple stakeholders that include a) private sector, b) central ministries of the Government of India, c) State Governments, d) Universities and School systems, e) Not for Profit organisations.

It currently has 38 Sector Skills Councils, which include 19 out of the 20 priority sectors identified by the Government of India. The sector skills councils have worked on the National Occupational Standards (NOS).

NSDC is administratively, a part of the Ministry of Skill Development and Entrepreneurship (MSDE) of the Government of India. It is headed by a CEO, and several experts. Its mandates are in three areas:

1. Proactively catalyse the creation of large vocational training institutions
2. Fund commercially viable, scalable, sustainable, businesses
3. Enable relevant support systems for skilling including Sector Skill Councils and Occupational standards

For the context of this study, the researcher approached NSDC during the middle of 2015, with the objective of engaging in the developing landscape of skill development. It also coincided with the launch of the Skill Development policy in July 2015. Soon after, a proposal was submitted to work on a small research project using qualitative approaches that could support the thesis. The research did not fructify due to several changes in the administrative and leadership of the NSDC. However some of the responses that were received as formal response to the questionnaire have been used in the study.

The website of NSDC from which some of the secondary data in this study has been used is : <https://www.nsdcindia.org>

## **Appendix X**

### **The Match Making Process**

A match box can be manufactured by three means:





- a. Hand-made or Manual Process
- b. Semi-mechanised Process
- c. Fully mechanized Process

## X (a). Manual or Hand-made Process

This process involves large amount of labour involved in almost all the stages with less machine intervention.

### Sub Processes involved:

#### Making of Outer Box and Inner Box

1.1. Peeling of Logs	The barks of the Selected logs are peeled. This is done manually with the help of a saw.	
1.2 Logs Cutting	The logs are cut along the length into pieces with the help of saw.	
1.3 Veneer Sheet Making	The logs are made into veneer sheets with the help of a machine.	
1.4 Creasing and Cutting of Sheets	The sheets are creased and cut for required size to make the box. Approximately 5000 gross can be produced in a day. (1 gross= 144 Nos)	
1.5 Outer Box Making	<p>The creased and cut smaller sheets are folded by carefully wrapping a blue paper over it stuck with a glue.</p> <p>In a day, one person can make unto 25 gross.</p> <p>Later the prepared boxes are arranged, in such a way to paint the sides with chemical, thus preparing the side friction of a match box.</p> <p>And then print Labels are stuck at the top.</p>	
1.6 Inner Box Making	In a similar fashion, the veneer sheets are creased and cut accordingly, and pasted by wrapping a blue paper around to make inner boxes. One person ("one man power"* can make unto 20 gross in a day.	





"one manpower" is a term used  
\* commonly independent of  
gender in the production units




## Production of White Splints

2.1 Peeling of Logs	The logs used for white splints making is light wood with less fibre content, preferably Poplar, Indian Matti and Aspen varieties. They are peeled.	
2.2 Cutting Logs	The logs are cut along the length.	
2.3 Veneer Sheet making	The sheets are made from the logs. The sheets are stacked in a rack.	
2.4. Chopping	The stacked sheets are chopped for a preferred size of splints.	
2.5 Sun Drying	The wet splints are exposed to sulphur and then sun dried.	
2.6 Sieving	It's then sieved to get rid of the waste and foreign items.	


### Dipping Splints

3.1 Preparation of Chemical Mix	A chemical mix is prepared with Chlorates and Bichromates of Potassium, Silica and various other chemicals in varying ratio.	
3.2 Frame filling	Splints are arranged in long, flat pieces of seasoned wood called 'lath' and are put together in a single frame.	
3.3 Dipping	The frames are dipped in molten wax to make them inflammable when lighted.  The prepared viscous chemical mix is spread over a dipping tray. The wooden frame with the splints is dipped and flattened from the top to get a uniform spread on the match head.	
3.4 Drying	The frames are sun dried naturally.	

### Box Filling

4.1 Box Filling	The dried frames are then taken, the dipped splints are removed lath by lath, and filled in the inner box and closed by the outer box manually. On an average, in a day, a manpower could fill 20 gross.	
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### Packing

5.1 Packing	The match boxes, say 10 or 12, were packed in a plain paper of around 40 GSM, and a printed label was put on top. 10 such packs are again packed to form a bigger pack. 6 such bigger packs are packed for the third time.	
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## X (b). Semi-mechanised process

In this method, the highly labour intensive and time consuming processes are mechanized, i.e Outer and Inner Box Making, Production of Dipped Splints and Packing. Therefore, manual labor is required only for box filling.

### Outer Box Making



3.1 Printing	With the onset of machine, wooden boxes were slowly replaced to cardboards. The Cardboards are printed in an Offset printing machine.	
3.2 Screening	The printed boards are screen printed to get the side friction.	
3.3 Cutting and Pasting	The screened boards are cut, and then tube pasted, which is the slitted. to get individual boxes.	

### Inner Box Making



4.1 Scoring	The cardboards are scored for required size. They are then sorted.	
4.2 Sorting and Pasting	The sorted skillets are pasted either manually or with the help of machine.	

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**Box Filling**

5.1 Box Filling	<p>This is done manually. The Dipped splints are sieved using a small manual serving instrument, and then the splints are filled in the boxes.</p>	 
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**Packing**

6.1 Packing		 
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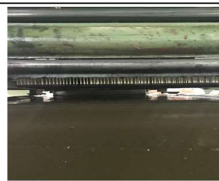
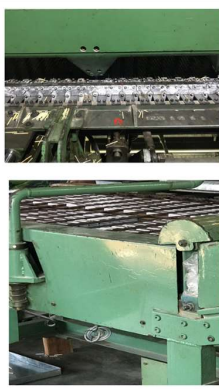


## X (c). Fully Mechanised Process


### 1. Production of White Splints

Same as in Semi mechanized.

### 2. Making of Match Box

2.1 Selected Splints	The selected splints are put in one side of the machine.	
2.2 Outer Box	The outer box machine is placed on the other side, which pastes the scored splints. The pasted outer boxes are given to the box filling section through a conveyor.	
2.3 Inner Box	The cardboard reels are converted into inner box by an inner box making machine, which is given to the box filling section through another conveyor.	
2.4 Dipping	The white splints are charged in mats, dipped in wax and head chemical, dried and the mats finally reaches the box filling section.	
2.5 Box Filling	In a major conveyor line, the inner box gets in the line first, the splints are pushed out by a pin bar in a way it falls right on the inner box and then the conveyor progresses, where the filled boxes are closed with the outer box. These match boxes are then taken for packing.	

### 3. Packing

3.1 Packing	Set of 10 or 6 boxes are packed in paper or BOPP. 10 such packs are shrink wrapped. 10 or 6 such wraps are put in a carton box and sealed.	
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## Appendix XI

### Questionnaire: Semi-structured Interviews

(English and Tamil Versions)

Research Location: Sivakasi Belt of Match Industry

2016

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Dear Participant,

This questionnaire is being sent to you as part of a research study on how knowledge is produced in the workplace and analyses the conditions that are important for the knowledge to be generated and transmitted across individuals, places and generations. In the process the study aims to look at issues that are important for vocational education and training.

The study is being done under as part of a Research Project supervised by Dr Susan Robertson and Dr Roger Dale of the University of Bristol, United Kingdom.

All the information you provide will be kept strictly confidential and the output of this study is only for academic and research purposes.

If you have any questions or concerns, please feel free to call me on [REDACTED] or write me at [narasimham.peri@bristol.ac.uk](mailto:narasimham.peri@bristol.ac.uk) or [REDACTED]

I sincerely thank you for your time and support for this research. The research will be discussed with you in person, after the data is collated for your approval.

You are free to decline participation at any time after the study has started if for any reason you are uncomfortable with any of the aspects of the study.

Sincere Thanks,  
Narasimham

-----

I, Thiru/Thirumathi/ Selvi \_\_\_\_\_  
திரு/திருமதி/செல்வி  
Son/daughter/ wife of \_\_\_\_\_  
மகன் / மகள் / மனைவி

Have understood the nature of the research and have no objection to participating in this research. I understand that I can withdraw from this study at any point of the study without assigning any reason, and my participation is completely voluntary.

Signed \_\_\_\_\_

கையொப்பம் \_\_\_\_\_

Date (தேதி) \_\_\_\_\_

Translated into Tamil by: \_\_\_\_\_

Demographic Profile  
(சூழ்நிலை விபரம்)

Language of main conversation (உரையாடலின் முதன்மை மொழி)			
Location இருப்பிடம்	Location or site at which the observation or interview was conducted. This should be in the context of the larger location description (Nature of the workplace) நேர்காணல் / கவனித்த இடம் மற்றும் பணியிடத்தின் இயல்பு நிலை	Occupation தொழில்	The work done through which the participants conducts his livelihood பங்கேற்பாளரின் செயல்பாடு வாழ்வாதாரத்தின் விபரம்
Date (தேதி)	Self Explanatory (சுய விளக்கமுறை)	Skill (திறன்)	
Name (பெயர்)	Identity, if allowed to disclose by the participant (அடையாள விவரங்களை வெளியிடுவதற்கு பங்கேற்பாளரின் ஒப்புதல்)	Formal Qualification (கல்வித் தகுதி)	
	Yes / No ஆம் / இல்லை		
Age (வயது)	Known or Derived age of the person (நபரின் வயது / தெரிவிக்கப்பட்ட வயது)	Place of Interview (நேர்காணல் நடைபெற்ற இடம்)	<ul style="list-style-type: none"> <li>Workplace (பணியிடம்)</li> <li>Outside Workplace (வெளிப்பகுதி)</li> <li>Home of worker (வேலை பார்ப்போரின் இல்லம்)</li> <li>Other (மற்ற இடம்)</li> </ul>

Time (நேரம்)	At which the interview was conducted. participants have to be within day/night /working hours or during breaks (எந்த நேரத்தில் நேர்காணல் நடத்தப்பட்டது பணிநேரம் / பணியிடைப்பட்ட நேரம் / இடைவெளி நேரம்)	Experience (பணி அனுபவம்)	
Location/Site Description பணியிட தள விளக்கம்	1. Characteristics of the site/location (பணியிட தளம் / இடத்தின் பண்பு நிலை)  2. Social Trends (சமூகப் போக்கு)  3. Language and Customs (மொழி மற்றும் பழக்க வழக்கங்கள்)  4. Prevalent political/social/family conditions (குடும்பம் / சமூக / அரசியல் ஈடுபாடு குறித்த முக்கிய நிலை)  5. Neighbourhood அண்டை / அயலார்		

Work and Learning Questions (பணி மற்றும் கற்றல் பற்றிய வினாக்கள்)	
Icebreaking questions (சுமுக உறவை மேம்படுத்த கேட்கப்பட்ட வினாக்கள்)	6. Family and Children (குடும்பம் மற்றும் குழந்தைகள்)
	7. Village and Background if male participant (ஆண் பங்கேற்பாளராக இருந்தால் அவர்கள் மற்றும் அவர்கள் வாழும் கிராமத்தின் பின்னணி)
	8. Village, children and their details if female participant (பெண் பங்கேற்பாளராக இருந்தால் அவர்கள் மற்றும் அவர்கள் வாழும் கிராமத்தின் பின்னணி)
	9. Any of their IMMEDIATE relatives in the match industry or in the same workplace? (அந்த தீப்பெட்டி தொழிற்சாலையில் உங்கள் முக்கிய உறவினர்கள் யாராவது பணி செய்கின்றார்களா?)  ஆம் / இல்லை  ஆம் எனில் விபரம்
How does he/she find the job? (இப்பணியினை எப்படி கண்டு பிடித்தீர்கள்)	10. a) Part time (பகுதி நேரம்) b) Full time (முழு நேரம்) c) Flexi-time (ஏற்ற நேரம்) d) Others (பிற) _____
How many hours? (எத்தனை மணி நேரம் பணி செய்கின்றீர்கள்)	What is the reason for choosing the category? இந்தப் பணி நேரத்தை தேர்ந்தெடுப்பதற்கான காரணங்கள்?  Is it decided by the worker or by the employer ? இந்தப் பணி நேரத்தை முடிவெடுப்பது தொழிலாளியா அல்லது முதலாளியா?

	<p>11. (Prompt) Would he/she have chosen to do this if he/she had formal education? நீங்கள் முறை சார்ந்த கல்வியை பயின்றும் இந்தப் பணியினை ஏன் தேர்ந்தெடுத்தீர்கள்?</p> <ul style="list-style-type: none"> <li>Why did he/she not have any formal education? நீங்கள் ஏன் முறை சார்ந்த கல்வியை பயிலவில்லை?</li> </ul> <p>a) Money- Family could not afford (பொருளாதாரம் &amp; குடும்பத்தால் உதவ முடியவில்லை)</p> <p>b) Gender Related (பாலின பாகுபாடு)</p> <p>c) Family Reasons (குடும்ப சூழ்நிலை)</p> <p>d) School is too far (பள்ளி வெகு தொலைவில் இருக்கின்றது)</p> <p>e) Education is not felt necessary (கல்வி எனக்கு அவசியமில்லை)</p> <p>f) Other (பிற) _____</p> <ul style="list-style-type: none"> <li>Will he/she have the same opinion for their children? (மேற்கூறப்பட்ட கருத்துக்கள் உங்கள் குழந்தைகளுக்கும் பொருந்துமா)</li> </ul> <p>Yes / No (ஆம் / இல்லை)</p> <p>If yes, please mention ஆம் எனில் அதன் காரணங்கள்</p> <p>If No, please mention இல்லை எனில் அதன் காரணங்கள்</p>
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<p>Describe the nature of your work? How important do you think it is in the overall scheme of things?</p> <p>உங்கள் பணியின் விபரங்களை கூறுக?</p> <p>பணி மற்றும் திட்டம் உங்களுக்கு எவ்வளவு முக்கியம் வாய்ந்ததாக கருதுகின்றீர்கள்?</p>	<p>12. Perception of work, (Prompt) complexity, inputs and outputs, <i>meaningfulness</i> of work (as against <i>usefulness</i> of work)</p> <p>வேலை பற்றி விளக்குக (உணர்வு, கடினத் தன்மை, உள்எீடு/வெளியீடு, பொருள் [உபயோகத்தன்மை இல்லாமல்])</p> <p>a) Only for salary, no meaning in work சம்பளத்திற்காக மட்டுமே பணித்திருப்பதின்மை</p> <p>b) Salary and some meaning சம்பளம் மட்டும் கொஞ்சம் பணி திருப்தி</p> <p>c) Equal importance to salary and meaning in work சம்பளம் மற்றும் திருப்தி சமவிகிதத்தில்</p> <p>d) Takes pleasure in the creativity of work, meaningfulness of work, training others in addition to Salary சம்பளம் தவிர வேலையில் படைப்பாற்றல், திருப்தி மற்றும் பயிற்சி</p> <p>e) Others (பிற)_____</p>
<p>13. Interviewer comments on the above and observations of the workplace (நேர்காணல் நடத்திபவரின் கருத்து)</p>	
<p>14. (Please attach any photographs if possible). புகைப்படம்</p>	



<p>How long has s/he been working at this workplace? நீங்கள் எத்தனை மாதம் / வருடம் இங்கு பணிபுரிகின்றீர்கள்?</p>	<p>15. Indicative Category (அறிகுறி வகை)</p> <p>Has he/she performed the same job for all the time? நீங்கள் எல்லா நேரங்களிலும் ஒரே பணியினை செய்கின்றீர்களா?</p> <p>a) If Learner or Apprentice (Less than one year) (பயிற்சி பெறுபவரா (அ) கற்றுக் கொள்பவரா ஒரு வருடத்திற்கு குறைவாக)</p> <p>b) Settled Worker (2 years or more) நிரந்தர பணியாளராக (2 வருடம் அல்லது அதற்கு மேல்)</p> <p>c) Expert (Trained 5 or more people) அனுபவம் மிக்கவர் (ஐந்து வருடம் அல்லது அதற்கு மேல்)</p> <p>d) Others (பிற) _____</p> <p>Interviewer comments: (நேர்காணல் நடத்துபவரின் கருத்து) Is the categorization above valid or the Number of years has to be different? மேற்கூறிய தகவல் சரி/தவறு. தவறாயின் அவர்களது பணி வருட அனுபவம் _____</p> <p>16. If any change was done, was it at his/her own request or the factory? பணி மாற்றம் ஏதும் தரப்பட்டதா? ஆம் எனில் அது தங்களின் கோரிக்கையினால் கிடைத்ததா அல்லது தொழிற்சாலை அளித்ததா?</p> <p>a) No Change in the work for the last ____ years கடந்த _____ வருடங்களாக பணியில் எந்த மாற்றமும் இல்லை</p> <p>b) Changed ____ roles within the factory தொழிற்சாலையின் உள்ளேயே பணி மாற்றம் நிகழ்ந்தது?</p> <p>c) Own request to change எனது கோரிக்கையின் மூலமாக பணி மாற்றம் நிகழ்ந்தது</p> <p>d) Did not have a choice when the role changed பணி மாற்றம் ஏதும் வழங்கப்படவில்லை</p> <p>e) Other (பிற) _____</p>
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How did s/he find this job? தங்களுக்கு எவ்வாறு இந்தப் பணி கிடைத்தது?	<p>17. Through a:</p> <p>a) Friend (நண்பன் மூலமாக)</p> <p>b) Relative at the same Factory or Unit (எனது உறவினர் இந்த தொழிற்சாலையில் பணி புரிகின்றார்)</p> <p>c) Relative at some other Factory or Unit (எனது உறவினர் வேறொரு தொழிற்சாலை அல்லது கிளையில் பணி புரிகின்றார்)</p> <p>d) Other (பிற) _____</p>
How did s/he first learn the job நீங்கள் எவ்வாறு தொழில் கற்றுக் கொண்டீர்கள்?	<p>18. Assess <i>difficulty</i> of learning (கற்றலில் ஏற்பட்ட சிரமத்தை மதிப்பிடுதல்)</p> <p>a) Very difficult to pick up the fundamentals அடிப்படை வேலையைக் கற்றுக் கொள்ள மிகவும் சிரமப்பட்டேன்</p> <p>b) Some difficulty, learnt it by myself சிறிது சிரமப்பட்டேன், நானாக கற்றுக் கொண்டேன்</p> <p>c) Some difficulty, got help from others around me சிறிது சிரமப்பட்டேன், அடுத்தவர்களின் உதவியோடு கற்றுக் கொண்டேன்</p> <p>d) Had no problems learning the work, _____ taught me நான் ஏதும் சிரமப்படவில்லை ஏனெனில் _____ எனக்கு கற்றுக் கொடுத்தார்</p> <p>e) Others (பிற) _____</p> <p>19. If it is option (d) above please elaborate - for trainer or teachers (எவ்வாறு கற்றுக் கொண்டார் என்பதை விரிவாக கூறுக)</p> <p>20. How long did it take for him or her to learn? கற்றுக் கொள்ள எவ்வளவு காலம் எடுத்துக் கொண்டீர்கள்?</p> <p>a) Less than 1 Month (ஒரு மாதத்திற்கு குறைவாக)</p> <p>b) 1-3 Months (ஒன்று முதல் மூன்று மாதம்)</p> <p>c) 3-6 Months (மூன்று முதல் ஆறு மாதங்கள்)</p> <p>d) More than 6 months (ஆறு மாதங்கள் முதல் 1 வருடம் வரை)</p> <p>e) More than 1 year (ஒரு வருடத்திற்கு மேல்)</p> <p>f) Other (பிற) _____</p>

	<p>21. What is the reason why he/she chose to come to work to this unit (இந்தத் தொழிற்சாலையில் நீங்கள் பணி புரிய காரணம் என்ன)</p> <ul style="list-style-type: none"> <li>• Proximity to Home (வீட்டிற்கு அருகில் உள்ளது)</li> <li>• Flexibility (என்னுடைய சூழ்நிலைக்கு சாதகமா இருப்பதால்)</li> <li>• Knows other people here (எனக்கு தெரிந்தவர்கள் இங்கு பணிபுரிவதால்)</li> <li>• Other (பிற) _____</li> </ul>
<p>Is he/she willing to learn a new operation? What if there is a new machine and you are trained to use it? Does having a machine excite you- as you are learning a new thing? நீங்கள் புதிய செயல்முறையை கற்க ஆர்வம் உள்ளீர்களா?</p> <p>நீங்கள் புதிய உபகரணத்தை இயற்றிட கற்று உள்ளீர்களா?</p> <p>நீங்கள் புதிய உபகரணத்தை உபயோகிக்க கற்றுக் கொள்ளும் போது மிகவும் சந்தோசமாக உணர்ந்தீர்களா?</p>	<p>22.</p> <p>a) Easily learnt the new machine working புதிய இயந்தரத்தை இயக்க கற்றுக் கொள்வது மிகவும் எளிமையாக இருந்தது</p> <p>b) Needed some help but was able to learn it புதிய இயந்தரத்தை இயக்க கற்றுக் கொள்ள மற்றவர்களின் உதவி தேவைப்பட்டது</p> <p>c) Quite difficult கொஞ்சம் கடினமாக இருந்தது</p> <p>d) Not able to adapt to the new machine புதிய இயந்திரத்தை இயக்க கற்றுக் கொள்ள முடியவில்லை</p> <p>e) Other (பிற) _____</p>
<p>If you saw a video of a new machine working, would you be able to learn? புதிய இயந்திரம் இயக்கப் படுவதற்கான காணொலியைக் கண்டால் நீங்கள் கற்றுக் கொள்ள முடியுமா?</p>	<p>23.</p> <p>a) I can learn from seeing the video நான் காணொலி பார்ப்பதன் மூலம் கற்றுக் கொள்ள முடியும்</p> <p>b) I cannot learn from seeing the video. I have to have someone train. நான் காணொலி பார்ப்பதன் மூலம் கற்றுக் கொள்ள முடியாது எனக்கு ஒருவர் பயிற்சி கொடுக்க வேண்டும்</p> <p>c) I can see the video and practice to learn the machine. நான் காணொலி பார்ப்பதன் மூலமும் சிறிது பயிற்சியின் மூலமும் கற்றுக் கொள்ள முடியும்</p> <p>d) Other (பிற) _____</p>

<p>Is there a recognition from your colleagues who are performing manual operations when you are learning the machine?</p> <p>நீங்கள் எந்திரத்தை கற்றுக் கொண்டு பயன்படுத்தும் போது மற்றவர்களால் உங்களுக்கு பாராட்டு மற்றும் அங்கீகரிப்பு கிடைக்கின்றதா?</p>	<p>24.</p> <p>a) You get recognition from other workers when you learn the machine நீங்கள் எந்திரத்தை கற்றுக்கொண்டு பயன்படுத்தும் போது மற்றவர்களால் உங்களுக்கு பாராட்டு மற்றும் அங்கீகரிப்பு கிடைக்கின்றது</p> <p>b) You DONT get recognition from other workers when you learn the machine நீங்கள் எந்திரத்தை கற்றுக்கொண்டு பயன்படுத்தும் போது மற்றவர்களால் உங்களுக்கு பாராட்டு மற்றும் அங்கீகரிப்பு கிடைக்க வில்லை</p> <p>c) I am doing it for myself நான் எனக்காக கற்றுக்கொள்கிறேன்</p> <p>d) I think it is important to learn the new machine because நீங்கள் எந்திரத்தை கற்றுக்கொண்டு பயன்படுத்துவதற்கான முக்கிய காரணம்</p>
<p>Will he/she allow their children to work in the same line of work?</p> <p>நீங்கள் உங்கள் குழந்தைகளை இதே தொழிற்சாலையில் பணிபுரிய விரும்புலர்களா?</p>	<p>25. Will allow children to work in the same workplace because</p> <p>எங்கள் குழந்தைகளை இதே தொழிற்சாலையில் பணிபுரிய விரும்புகிறேன் ஏனெனில்</p> <hr/> <p>Will NOT allow children to work in the same workplace because</p> <p>எங்கள் குழந்தைகளை இதே தொழிற்சாலையில் பணிபுரிய விரும்பவில்லை ஏனெனில்</p> <hr/>
<p>Owner Specific Questions:</p> <p>26. Why did he (*) choose this town for locating the factory? நீங்கள் தொழிற்சாலையை ஆரம்பிக்க இந்த நகரத்தை தேர்ந்தெடுக்க காரணம் என்ன?</p>	

<p>27. Was there anything specific that he felt when the location was selected? நீங்கள் தொழிற்சாலையின் ஆரம்பிக்க இந்த இடத்தை தேர்ந்தெடுத்த போது ஏதாவது முக்கிய காரணம் இருந்ததா?</p>	
<p>Would s/he hire someone from the same family/ community or caste? Why? நீங்கள் வேலைக்கு ஒரு நபரை தேர்ந்தெடுக்கும் போது ஏன் ஒரே குடும்பத்தினரையோ ஒரே சமூகத்தினரையோ அல்லது ஒரே சாதியினரையோ தேர்ந்து எடுக்கின்றீர்கள்?</p>	<p>28. a) Will hire from same area or community because _____ நாங்கள் ஒரே குடும்பத்தினரையோ அல்லது ஒரே சமூகத்தினரையோ அல்லது ஒரே சாதியினரையோ தேர்ந்து எடுக்க காரணம் ஏனெனில் _____ b) Will not be particular to hire from same area or community because _____ எப்போதும் நாங்கள் ஒரே குடும்பத்தினரையோ அல்லது ஒரே சமூகத்தினரையோ அல்லது ஒரே சாதியினரையோ தேர்ந்து எடுக்க வில்லை ஏனெனில் _____ c) Will NOT hire from the same area or community because _____ ஒருபோதும் நாங்கள் ஒரே குடும்பத்தினரையோ அல்லது ஒரே சமூகத்தினரையோ அல்லது ஒரே சாதியினரையோ தேர்ந்து எடுக்க வில்லை ஏனெனில் _____</p>
<p>What is the purpose of his/her working- is it only livelihood or a 'time-filler'. இங்கு பணிபுரிபவர்கள் அவர்களது வாழ்வாதாரத்திற்காகவா அல்லது அவர்களது அன்றைய தேவையை பூர்த்தி செய்வதற்காக பணி புரிகின்றார்களா?</p>	<p>29. This question is related to 25 (c ) above. இந்தக் கேள்வி கேள்வி எண் 10(c)க்கு தொடர்புடையது a) Will allow children to work in the same line because _____ எங்கள் குழந்தைகளை இதே தொழிற்சாலையில் பணிபுரிய விரும்புகிறேன் ஏனெனில் _____ b) Will NOT allow children to work in the same line because _____ எங்கள் குழந்தைகளை இதே தொழிற்சாலையில் பணிபுரிய விரும்பவில்லை ஏனெனில் _____ c) Learning culture and social roles (Durkheim, Parsons) சமுதாய பங்களிப்பு மற்றும் அனைத்தையும் கற்றுக் கொள்ளும் கலாச்சாரமாக d) Is skill enhancement and knowledge acquisition a function of time- or any other dimensions? வேறு ஏதாவது வகையில் இந்த வகையான பயிற்சி மற்றும் திறன் எந்த நேரத்தில் உதவும்?</p>

<p>How did s/he handle failures- describe a failure from which a critical learning came?  உங்களுக்கு ஏதாவது கற்றுக்கொள்ள முடியாத சூழலில் நீங்கள் அதனை எவ்வாறு எதிர்கொள்வீர்கள்?</p> <p>Who helped overcome it?  யாருடைய உதவியினால் அதனை மேற்கொள்வீர்கள்?</p>	
<p><b>New Apprentices:  (less than 1 year)</b></p> <p>Tell me 3 things that worked well when you came in and 3 things that you didn't like the way it happened?</p> <p>நீங்கள் பணிபுரியும் போது உங்களுக்கு பிடித்த மற்றும் பிடிக்காத மூன்று விவரங்கள் பற்றி குறிப்பிடுக</p>	<p>What worked well?  பிடித்தவைகள்  a)  b)  c)</p> <p>What didn't work well?  பிடிக்காதவைகள்  a)  b)  c)</p>
<p>Can you tell me who else I can talk to in your workplace?  உங்கள் பணியிடத்தில் நான் வேறு யாருடனாவது பேச விரும்புகின்றீர்களா?</p> <p><b>(Reference for  Secondary Participant)</b></p>	<p>ஆம் / இல்லை  ஆம் எனில் விவரங்கள்</p>

## Appendix XII

### Questionnaire- Policy Maker

Interview Format- Data Collection – Policy-maker segment of Research Sample.

Session 1: (Proposed Policy Level Direction and insights that can be used/tested during Field Work). **February/March 2016**

Session 2: Sharing of the Field Work Highlights with CEO and highlighting elements of research that can contribute as supplementary information to research already existing with NSDC. This is proposed in **about 3-4 months** after the research is conducted.

Pre-interview: Audio Check and recording equipment; Pleasantries

Time Allocation: Sharing of Research Direction, Outline and Approach (Researcher)- *10 Minutes*

Questions & Answers on the following lines (*45 Minutes*)- Researcher & CEO

Buffer time/ Closing Remarks: *5 minutes*

#### **Session 1- Section- 1 ( Appx 25 minutes)**

1. The National Policy on Skill Development (July 2015) states a dual challenge of skills paucity and non-employability of a section of youth who have no or little skills (Sec 1.2). How does NSDC include the latter in its capacity planning and pedagogical considerations?
2. The need for skilled manpower is benchmarked to better the current 4.69% of the total workforce (Sec 2.2). Is NSDC cognizant of the smaller, traditional communities of skills (in traditional set-ups) that may not have been included in the aggregation of data with NSSO?
  - a. What are the other sources of data assimilation that NSDC uses to draw skill maps?
  - b. How much, if any, differentiation is needed within the existing Sector Skill Councils, for a policy decision relating to the NOS? For instance if there is a skill section of say 500 people, would the SSCs identify this as a different skill or an Occupational Standard?
3. The QP- NOS representing a particular skill sector or an activity of work are currently identified and certified by the respective sector skill councils (4.38 and 4.39 of Policy). Is NSDC looking to identify/mark those QP-NOS that might be relevant or even similar to activities of work in another Sector?

4. Section 4 (Policy Framework) gives the impression that all skills are recognized only within a formal certification system. Section 4.3.10 specifically talks about Recognition of Prior Learning. Whilst this is definitively a positive step, do you see two worlds of certified skill and a skill without certification co-exist within reported employment?

## **Section -2 (20 minutes)**

5. If we for the purpose of this discussion classify traditional skills as those that emerge from *non-formal* processes or *home-grown* methods, outside the classroom-based training, how could such traditional skills, even those that are deployed in organized industry be included in a larger capacity-building discourse? This is partially related to Sec 4.4.9.
6. Given that such skills may not add up to large numbers, however could be significant in generating employment locally, with minimal interventions (say, self-certification or incentives at the POD- point of delivery), would there be an opportunity to find methods of identifying and encouraging such *skill communities*? (This point is being researched as a comparative with other developing countries as a supplementary research input).
7. Can Section 4.2.9 (Apprenticeship) of the Policy on Skill Development be extended in interpretation to include cases in the informal economy such as the one proposed in the project?
8. The method of research proposed here is to examine (not describe) the micro situation of work and draw insights into a larger work practice (Researcher to share the methodology and method in full detail here). Do you have any advise on what can be done to bring the workplace descriptors for meaningful interpretation at a macro level?

## **Example: Member-checked Interview-Policy Maker**

NSDC – Interview with CEO (represented by Ms Priyambda Tripathi, Research Wing, NSDC, [REDACTED])

Venue: 5<sup>th</sup> Floor, NSDC Building, Clarion Collection, Qutub Institutional Area, New Delhi

Time and Date: 8<sup>th</sup> March (International Womens Day!)

I (Researcher) explained the objective of the exercise and there was a discussion on my methodology and scope of the study.

The following Q&A was conducted over the period of about 70 minutes.



1. The National Policy on Skill Development (July 2015) states a dual challenge of skills paucity and non-employability of a section of youth who have no or little skills (Sec 1.2). How does NSDC include the latter in its capacity planning and pedagogical considerations?

Answer 1:

NSDC interventions are directed primarily at capacity creation. It is driven on a stated business model and encourages partnerships with the private sector, public sector and other formal organisations that are stakeholders in skill development. The main role is as a facilitator of soft loans for providers through a rigorous system of evaluation. It is a catalyst for the private sector interest in skill development

Supplementary Question:

How does the specific segment of the employable population or the youth, figure on this roadmap. It is with specific reference to the section 1.2 of the National Policy on Skill Development, July 2015 ( also referred to as the skill policy ) 2015.

Answer: The current direction for NSDC for such categories of youth is through the PMKVY (**Researcher Notes:** Pradhan Mantri Kaushal Vikas Yojana - Kaushal Vikas is the hindi equivalent for skill development <http://www.pmkvyofficial.org> ) to train 24 Lakh (2.4 Million) youth as a target for employment. As a part of this programme, model training centres will be established in each of the districts in India. This is an outreach measure and will enable quality control to reach to the specific district level. This is the smallest unit for control of the process.

There are guidelines for trainers and how the training will be imparted and certified.

2. The need for skilled manpower is benchmarked to better the current 4.69% of the total workforce (Sec 2.2). Is NSDC cognizant of the smaller, traditional communities of skills (in traditional set-ups) that may not have been included in the aggregation of data with NSSO?

Answer 2:

NSDC is aware that there are several small communities of skilled workers but current policy does not include such communities directly. The responsibility for the mobilization of trainees is with the training provider. NSDC does not control who attends or who needs the training.

The current priority is to increase awareness of skill development initiatives as well as to enable the basic infrastructure. The QP-NOS and similar standardization measures are used to mitigate the risks to implementation. Some of the gaps are bridged to some extent.

Supplementary question:  
Does NSDC control pedagogy?

To an large extent this is done by alignment with the QP-NOS. All training inputs are focused towards the standardized Occupational standards. In some cases MOU (Researcher Note: Memorandum of Understanding. Typically a legal agreement that is signed by two entitites towards a common purpose). Have been signed with the public sector companies, who decide the output and the pedagogy. The partnership with NSDC provides the alignment and the formalized recognition structure. As an example Coal India Limited that has an MOU with NSDC is targeting 1 lakh people through the RPL (Recognition of Prior Learning) route. ([http://articles.economictimes.indiatimes.com/2015-05-03/news/61768323\\_1\\_skill-training-national-skill-development-fund-entrepreneurship-rajiv-pratap-rudy](http://articles.economictimes.indiatimes.com/2015-05-03/news/61768323_1_skill-training-national-skill-development-fund-entrepreneurship-rajiv-pratap-rudy))

- a. What are the other sources of data assimilation that NSDC uses to draw skill maps?

Answer 2a:

Primary Data is from NSSO (National Sample Survey Organisation) as well as the Annual Survey of Industries

Primary Data collection for the District-wise reports has also been done but the sample size of people spoken, across a cross-section of skills, is small.

In the past data has also been collected through select FGD (Focus Group Discussions) conducted by consulting partners like EY (Ernest and Young), etc.

Data is through the training providers. New providers go through an onboarding and orientation programme that is monitored by NSDC.

- b. How much, if any, differentiation is needed within the existing Sector Skill Councils, for a policy decision relating to the NOS? For instance if there is a skill section of say 500 people, would the SSCs identify this as a different skill or an Occupational Standard?

2b. This question may have to be answered at a policy level by NSDC leadership.

In general the dependency for enrolling any community of skills is with the Sector Skill Council (SSC). The general rule is to have a producer organisation or a larger industry sector represent itself through its members. NSDC recognizes any need that is galvanized through the producing organization.

Supplementary question:  
I understand SSCs. Can you give me an example of the producer organization?

Examples: Rangasutra ( producer company for handicrafts)  
Masuta: Silk weaving company registered under the Companies Act

In short, it is a “collective action” driven agenda and therefore some skill areas that are unrepresented by the larger collective interests may not be actively involved with our programmes.

Supplementary question: Some marginalized communities may be left out...?

Answer: Yes, because of the business model..

3. The QP- NOS representing a particular skill sector or an activity of work are currently identified and certified by the respective sector skill councils (4.38 and 4.39 of Policy). Is NSDC looking to identify/mark those QP-NOS that might be relevant or even similar to activities of work in another Sector?

Answer 3:

I may not be the best person to answer this question. Will redirect this to the right person in the organization.

4. Section 4 (Policy Framework) gives the impression that all skills are recognized only within a formal certification system. Section 4.3.10 specifically talks about Recognition of Prior Learning. Whilst this is definitively a positive step, do you see two worlds of certified skill and a skill without certification co-exist within reported employment?

Answer 4:

Yes, the process of recognition of skills is a formal process. We have currently not considered bringing on board the skills that are currently not formalized.

This could also be a question at a higher policy level, therefore I cannot comment.

## Section – 2

5. If we for the purpose of this discussion classify traditional skills as those that emerge from *non-formal* processes or *home-grown* methods, outside the classroom-based training, how could such traditional skills, even those that are deployed in organized industry be included in a larger capacity-building discourse? This is partially related to Sec 4.4.9.

Answer 5:

The policy-making needs to be creative to address any issues in the informal sector. All the challenges of the sector are currently not addressed by the policy.

6. Given that such skills may not add up to large numbers, however could be significant in generating employment locally, with minimal interventions (say, self-certification or incentives at the POD- point of delivery), would there be an opportunity to find methods of identifying and encouraging such *skill*

*communities?* (This point is being researched as a comparative with other developing countries as a supplementary research input).

Answer 6:

suggested to see the PMKVY site (<http://www.pmkvyofficial.org> )

7. Can Section 4.2.9 (Apprenticeship) of the Policy on Skill Development be extended in interpretation to include cases in the informal economy such as the one proposed in the project?

Answer 7:

Training is currently been driven largely in classroom. Eg. Hospitality and Hotel management as a skill has been done in state-of-the art classrooms.

Supplementary question: What about skills that require a more situated way of learning?

We are aware of lathe machines and tool room infrastructure, but in general that is dependent on the partner and what their business model is relevant to the sector.

However outside of the NSDC framework there are efforts by CII (Confederation of Indian Industry) and similar others assisting manufacturing. (Researcher comments: This needs to be further examined)

8. The method of research proposed here is to examine (not describe) the micro situation of work and draw insights into a larger work practice (Researcher to share the methodology and method in full detail here). Do you have any advise on what can be done to bring the workplace descriptors for meaningful interpretation at a macro level?

Answer 8:

We would like to see more case studies. It could give us more specific insights into macro trends.

(She gave an example of a study that she was involved in the past in Bihar amongst Shoe-makers). Assessment of community habits, beliefs and the work ethic provided a comprehensive view on creating livelihood strategies)  
Important questions that would help from a policy perspective:

“who is the beneficiary?”

“who is the policy designed for?”

These two questions need to be asked from a policy perspective  
Value orientation or a cause is important for data. She quoted SEWA and how numbers in that context make sense with the human face of development.

-----End of collated answers-----

## **Appendix XIII**

### **Proposal for Qualitative Research- NSDC**

#### **Supplementary Sector Study Proposal**

#### **Background:**

Based on Research Proposal dated 07 July 2015, and subsequent discussions with Ms Gouri Gupta of NSDC, the following proposal for a PILOT STUDY incorporating discussion points is hereby submitted:

1. The proposed PILOT research will cover two case-studies broadly representing two homogeneous industry clusters as below:

Case Study 1: Handloom Weaving, Erode District, Tamil Nadu

Case Study 2: Match-making Industry, Virudhunagar and Vellore Districts, Tamil Nadu

The clusters are identified in the district-wise reports (NSDC, 2012)<sup>45</sup> in some form, but only partially reflect the skill map for the respective industries/segment. One reason for this may be the aggregation of data from these clusters into larger industry groupings (Eg: Handloom clustered with Handicrafts; Match-making clustered with Fireworks). However, the purported objective of the proposed study is not to identify the technical gaps in the skill-map; it is to use the existing reference points of data to expand into a comprehensive description of the clusters, possibly chart out a defined sub-cluster and enumerate the uniqueness of skills, training processes, characteristics of knowledge-production and

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<sup>45</sup> NSDC District-wise – Skill Gap Reports, 2012, Tamil Nadu. [www.nsdcindia.org](http://www.nsdcindia.org)

competencies, with an objective of reflecting employability within the cluster.

Each of the identified case study represents a different landscape for skills and employment. Some of the characteristics of the cluster may be unique to the location or the geographic area. The attempt to call out those that may have uniqueness to the location, as well as transversal skills<sup>46</sup> within the cluster, that could have an impact on the skill-map for the aggregated cluster or other clusters within the geography or even elsewhere in the country (Eg: A set of skills *within* the match-making process, that is akin to a skill set in some other industry or cluster *outside* of the match industry). Transversal Skills refer to a set of competencies that are acquired in one context and are transferable across employment sectors.

## **2. Approach to Comprehensive Skill Mapping :**

The broad approach, common to both the Case Studies is by using Qualitative techniques. The case study approach enables dis-aggregation of numeric data into real situations, identifying variables that influence skill building, availability and people-orientation that enhances the understanding of the skill gap for the cluster. For example, primary data collection and interpretation using qualitative means can offer perspectives on a particular dimension of skill development in Case Study 1 that identified three generic constraints relating to aspirations of youth for policy decisions. These are: an unwillingness to migrate, an unhealthy attitude to work and a low awareness of benefits of vocational training (Page 78, NSDC Skill Gap Report, 2012). The approach suggested for the Case Study can provide a possible explanation incorporating the responses to the “constraints” through semi-structured interviews, offering a better explanation for policy or interventions. The inferences from the qualitative studies may also assist in qualifying the projections (reduction in workforce requirements) for the

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<sup>46</sup> <http://www.unescobkk.org/education/news/article/making-transversal-skills-a-reality-in-tvet-a-study/>

Handloom Industry (by 3000 people) for 2012-17 and 2017-22 (Page 259, Sec 7.7, NSDC Skill Gap Report, 2012).

Similarly, for Case Study 2, there is no skill map for the cluster in the geographic region outside of Virudhunagar district (Page 63); whereas there is evidence of match-making in large quantities in Vellore District. The qualitative approach in this case may provide a better understanding of not just the geographic locations but also comparisons and contrasts within the locations. The skill-map therefore could be enriched with thematic occurrences that could be traced to other clusters in such locations.

The instances above are limited in scope at this phase of study, but used more as exemplar of the nature of outcomes from the study itself, when done in entirety.

### **3. Outcomes from the Proposed Studies:**

3.1 Identification and description of the distinct sub-segments within the sector :

Cottage Industry, Semi-mechanized and mechanized (for match industry).

3.2 Identification of the Key roles in the sector- What are the specific job categories, with their corresponding skill determinants (if not already done under QP/NOS)?

3.2.1 Whether the informal workgroups confirm to such standards and can there be qualifications/training framework identifiable for the roles? (For the Match Industry or related chemical industry, this can be useful given that there are no QP/NOS certified so far)

3.2.2 A list of the formal/informal qualifications/experience (complementing or in-lieu of qualifications) and competencies to identify the specific skill required.

3.3 A ground-up correlation of individual competencies to the QP-NOS for Textile and Handloom<sup>47</sup>.

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<sup>47</sup> <http://texskill.in/research/qp-nos/>

3.4 Relevance to NOS, particularly in the semi-formal or informal sector. (Eg: Shuttleless loom weaver and standards related to TSC/Q2203- Job Descriptions of N2205, 2206, 9001, 9002, etc) or similar<sup>48</sup>.

The workflow (input-output) to the job role (This enables assessment of cross-skilling opportunities vis-à-vis the particular role, as well as transferable skills)

3.5 Role holder interviews: An assessment of the nature of work, degree of formal/informal knowledge base or work instructions and any potential intervention of formal skill programmes.

3.6 Corollary input to ITI/ITC syllabus and pedagogical input (This requires study and interviews of the relevant experts).

3.7 Role holder ecosystem interviews: an outside-in assessment of what the role holder needs to possess in terms of skills and experience.

3.8 An assessment of Transversal Skills for particular roles.

#### **4. Research Methodology:**

##### **4.1 Methods:**

- Semi-structured interviews (multiple interactions)
- Ethnographic methods of physical on-site observations
- Analysis of Artifacts, Documents; oral, written or pictographic representations
- Visual evidence, including photographs and videos, capturing key processes

##### **4.2 Proposed Sample/ Coverage:**

- 8-10 Roles for each cluster for the skill mapping

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<sup>48</sup> <http://www.nsdcindia.org/index.php?q=textile>



- Interviews with at least 15 role-holders; supplementary interviews with role-holders and work-ecosystem (colleagues, stakeholders, family)
- Identification of at least 10 employers in each cluster, representing the different classifications within the spectrum (small to larger)

#### **4.3 Analysis and Recommendations:**

- Skill Maps, Position Descriptions, Competencies,
- Correlations, and thematic highlights
- Theoretical frameworks deployed for academic understanding, research or practice and pedagogical recommendations where applicable. This is with a view to replicate and standardize the research process at a later date.

The research will be led by an academic researcher of the University of Bristol, UK, with considerable industry experience in India. The research will be conducted with the highest international standards of research with integrity, academic scrutiny and supervision standards. The specific advantages of comparators, latest literature, access to locations not available through normal survey methodologies are integral to the proposal. The project will be governed by the research and academic standards required for a study of this kind

#### **5. Scalability and Transferability:**

In addition to the set of job roles for the clusters, there is a specific expectation from NSDC to be able to deploy the outcomes of this project as follows:

- a) To identify and contribute to the transferable skills outside the clusters. Every attempt will be made to provide pointers towards transferable/transversal skills under the scope of the study.
- b) To replicate and deploy the qualitative approach in a larger scale for other studies/sectors.

To point (b) the following is proposed:

- In addition to the documentation of pilot, the Research team builds a process document for enabling replicability of the exercise.
- A catalogue of skills (where not included in NOS) and an assessment of the training interventions (apprentice learning document)
- Potential for training additional resources and/or guiding teams to conduct such research and creating further documentation through additional location/area studies. This is proposed through a 2-day workshop to be conducted for NSDC/designated researchers.

#### **6. Evidence-based policy guidance as an output of this research:**

- Specific inputs from individual interviews
- Thematic analysis from a set of interviews that informs policy direction (Industry, Government and NSDC)
- Traceable evidence (except where anonymity is requested by participant).
- English transcription of interviews to corroborate thematic analysis.
- Audio/Video where possible and annotated photographic description of processes reflecting skill complexity or training tools.
- Correlations to existing Sectoral studies qualifying Skill gaps and highlighting potential actionables; specific callouts to generic recommendations of other/related surveys or SSC inputs
- Expert assessment of learning environment, pedagogies and training tools.
- Comparable references and explanations using theoretical models, where applicable.

- Documentation of Knowledge production, transmission and enhancement of learnability.

This informs Apprentice programmes and interventions, as well as indicators to other clusters that have similarities in Social Structures, Skill requirements or Competencies (for instance, a set of competencies have transversal application outside the match industry, but in a similar social context)- eg. Flexible working for women that is enabled through a socially-dependent network pool of contacts.

## 7. Cost of Research:

The cost for the turnkey project will be as follows:

Research Cost: INR 14,60,000+ service tax; to be completed in 5 months.

Cost Estimates Per Pilot	Researcher Costs (Direct Field Presence and Indirect research and analysis)	Rs. 10,50,000	The costs are indicative and subject to final agreement by Researcher and NSDC, based on final scope and estimation of Research effort for the PILOT.
	Field Support assistance (Research Assistance, Translations/Enumerator/Any licence cost NVivo storage of data)	Rs. 1,75,000	
	Travel and Communication	Rs. 1,85,000	
	Field expenses, consumables, material indexing, photographic and artifact recordings	Rs. 50,000	
		Rs. 14,60,000	
	Training on Replicating the Research, interpretation and scalability (2 Days facilitation, simulation, course material and evaluation)- For action item 5 (b) above	To be discussed separately and based on location and extent of coverage	

## 8. Terms of Reference:

As required by NSDC. Governance and Review to be discussed once principal agreement on the scope of the project is agreed upon.

We thank you for considering our proposal and look forward to hearing from you on the next steps. We are confident of partnering with NSDC Teams in building this unique research capability and contributing to the emerging knowledge base for skills and employability.

Sincerely,

A solid black rectangular box used to redact the signature of the sender.

Narasimham PNSV

## Appendix XIV

### Signed Consent- Interviews

I, Thiru/Thirumathi/ Selvi  
திரு/திருமதி/செல்வி  
Son/daughter/ wife of  
மகன் / மகள் / மனைவி

Have understood the nature of the research and have no objection to participating in this research. I understand that I can withdraw from this study at any point of the study without assigning any reason, and my participation is completely voluntary.

Signed

கையொப்பம்

Date (தேதி)

Translated into Tamil by:

Location masked  
Interview @ workplace.  
Key insights  
Resistance to  
automation - Not  
attempted.

# Appendix XV

## Signed Consent - Photographs

### Photo Reproduction Rights Form SAFETY MATCH Industry Research Study

Name: Mr. S. Padmanaban / RAJASHREE MATCH WORKS

This form refers to the photographs you supplied, or the photographs you allowed **Narasimham Peri** to make, as part of the research study in which you have participated. All photographs will be securely stored by the researcher. As discussed with you, photographs may be shared by the researcher with persons authorized by the University Of Bristol, to help with the analysis of the research. The photographs may also be used (in electronic or print form), in reports, presentations, publications and exhibitions arising from the project. Credit courtesy where required will be provided to you/Rajashree Match Works.

Please Sign the below box

I give my consent for the following photographs to be reproduced for educational and/or non-commercial purposes, in reports, presentations, publications, websites and exhibitions connected to the SAFETY MATCHES Industry study conducted at our factories located in Sattur and Thiruvirunthalpuram, Tamil Nadu.

I further state that wherever specific individuals have been named in the photographs they have provided the consent. Due to their being illiterate, they have not been able to affix signatures. Any photographs with the names are not permitted for use, with their real names or work-location identifiers.

Signed:.....  
(S. Padmanaban)

Date : 26.08.2018



Thank you for participating in this project. If you have any queries about this form or about the project or your participation in it, please do not hesitate to contact Narasimham P @ [redacted] or np14127@bristol.ac.uk

Form Courtesy :  
ESRC National Centre for Research Methods, October 2008. NRM/011